Vol. 1018 Number 2

OFFICIAL GAZETTE

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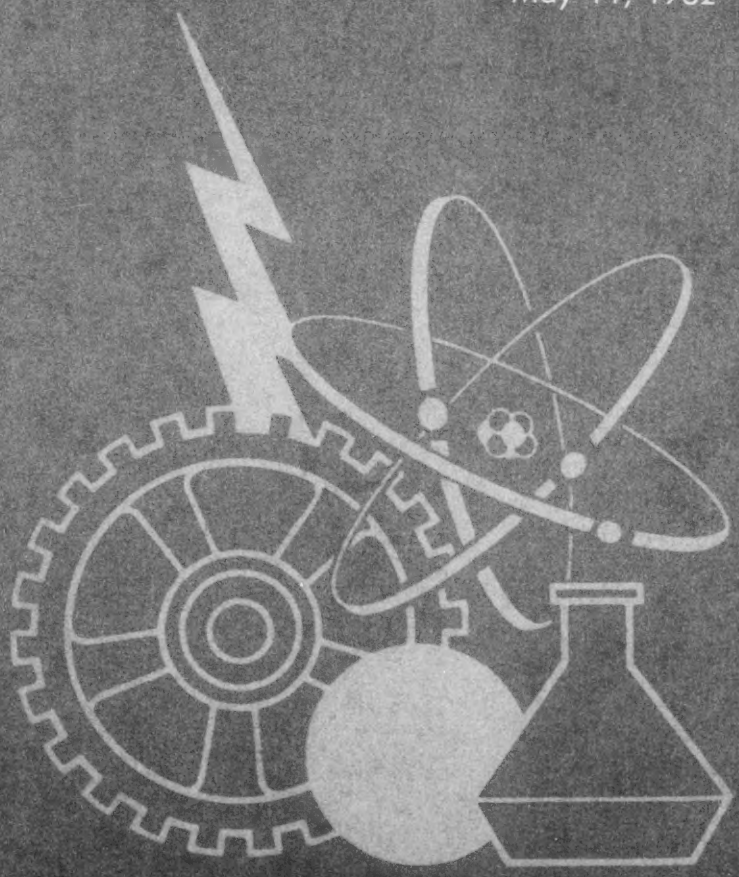

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries and the most recent PCT rule changes see the notices appearing in the Official Gazette at 1001 O.G. 14 on Dec. 9, 1980 and at 1012 O.G. 20 on Nov. 17, 1981.

Note that the international fees have been increased as of Jan. 1, 1982. The current schedule of fees is as follows:

Transmittal fee	$ 35.00
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Basic Fee (first 30 pages)	270.00
Basic Supplemental Fee (for each sheet over 30)	6.00
Designation Fees	65.00

GERALD J. MOSSINGHOFF,
Jan. 19, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,935,996, Re. S.N. 353,326, Filed Mar. 1, 1982, Cl. 220/306, CONTAINER, John C. Schubert, et al., Owner of Record: *Standard Oil Co., Chicago, Ill.,* Attorney or Agent: William T. McClain, et al., Ex. Gp.: 241

4,192,213, Re. S.N. 357,065, Filed Mar. 11, 1982, Cl. 84/293, STRINGED MUSICAL INSTRUMENTS, Ned Steinberger, Owner of Record: *Inventor,* Attorney or Agent: Finnegan, et al., Ex. Gp.: 211

4,313,067, Re. S.N. 353,410, Filed Mar. 1, 1982, Cl. 307/494, SENSOR-INTEGRATOR SYSTEM, James A. White, Owner of Record: *Miles Laboratories, Inc., Elkhart, Ind.,* Attorney or Agent: L. E. Davidson, et al., Ex. Gp.: 254

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,959,693, Reexam. No. 90/000,188, Requested: Apr. 8, 1982, Cl. 361/45, GROUND FAULT INTERRUPTER APPARATUS WITH MEANS PROTECTING AGAINST A GROUNDED NEUTRAL CONDITION, Kenneth R. Coley, et al., Owner of Record: *Requester,* Attorney or Agent: G. H. Telfer, Ex. Gp.: 212, Requester: Westinghouse Electric Corp., Pittsburgh, Pa.

4,189,034, Reexam. No. 90/000,189, Requested: Apr. 13, 1982, Cl. 188/318, HYDRAULIC DAMPER, Tetuo Kato, Owner of Record: *Requester,* Attorney or Agent: Wegner & Bretschneider, Ex. Gp.: 310, Requester: Tokico Ltd., Kawasaki-ken, Japan

4,200,459, Reexam. No. 90/000,184, Requested: Apr. 29, 1982, Cl. 75/170, HEAT RESISTANT LOW EXPANSION ALLOY, Darrel F. Smith, Jr., et al., Owner of Record: *Huntington Alloys, Inc.,* Attorney or Agent: Ewan C. MacQueen, Ex. Gp.: 111, Requester: Inco Research & Development Center, Inc., Suffern, N.Y.

4,209,438, Reexam. No. 90/000,187, Requested: Apr. 7, 1982, Cl. 260/031.8x1, ELECTRICAL INSULATING COATING COMPOSITIONS, Yasunori Okada, et al., Owner of Record: *Hitachi Chemical Co., Ltd., Tokyo, Japan,* Attorney or Agent: Craig & Antonelli, Ex. Gp.: 140, Requester: E. I. du Pont de Nemours & Co., Wilmington, Del.

Patents Available for Licenses or Sale

4,319,748. SPORT TRAINING DEVICE. *Efim Alter,* 7533 Horrocks St., 1st Fl., Philadelphia, Pa. 19152.

4,255,697. CASH REGISTER POWER SUPPLY SYSTEM. *James A. Oliff, Stevens, Davis, Miller & Mosher,* 1911 Jefferson Davis Hwy., Suite 600, Crystal Mall 1, Arlington, Va. 22202, 703-920-8900.

4,154,444. GAME BOARD. *Nathan D. Grenell,* 815 Hanson St., Whitehall, Mich. 49461. 616-894-6350.

General Electric Co. is prepared to grant non-exclusive licenses under the following patent(s) upon reasonable terms to domestic manufacturers.

Application for license may be addressed to: Patent Counsel, Aerospace Control Systems Department, General Electric Co., P.O. Box 5000, Binghamton, N.Y.

4,082,949. VARIABLE INTENSITY FLUORESCENT DISPLAY.

Applications for license may be addressed to: General Electric Co., Component Motor Division, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind., 46801-2204, Attention: Patent Counsel.

4,276,690. METHOD OF ASSEMBLING COMPONENTS OF A THERMOSTAT.

4,286,188. AMRPHOUS METAL HYSTERESIS MOTOR.

4,275,536. WALL ELEMENT FOR A CONSTRUCTION WALL. *Karl H. Vahlbrauk,* Driegerweg 1, D-3353 Bad Gandersheim, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

The RCA Corp. offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corp., Sr. Vice President, Licensing, 30 Rockefeller Plz., New York, N.Y. 10020

4,316,213. VIDEO PROCESSOR EMPLOYING VARIABLE AMPLITUDE COMPRESSION OF THE CHROMINANCE COMPONENT.

4,316,214. KEYING SIGNAL GENERATOR WITH INPUT CONTROL FOR FALSE OUTPUT IMMUNITY.

4,316,219. SYNCHRONIZING CIRCUIT ADAPTABLE FOR VARIOUS TV STANDARDS.

4,316,220. IF BANDPASS SHAPING CIRCUITS.

4,316,279. OPTICAL RECORDING IN THIN PHOTORESIST.

4,316,281. SPACER FOR STACKED RECORDED DISCS.

4,316,282. MULTICHANNEL FREQUENCY TRANSLATION OF SAMPLED WAVEFORMS BY DECIMATION AND INTERPOLATION.

4,316,430. VAPOR PHASE DEPOSITION APPARATUS.

4,316,539. VIDEO DISC CADDY.

4,316,778. METHOD FOR THE MANUFACTURE OF RECORDING SUBSTRATES FOR CAPACITANCE ELECTRONIC DISCS.

4,316,816. METHOD FOR PREPARING COPPER-ALUMINUM-GOLD-ACTIVATED ZINC-SULFIDE PHOSPHORS.

4,317,050. USER CONTROL ARRANGEMENT FOR CONTROLLING A PLURALITY OF FUNCTIONS.

4,317,065. COLOR PICTURE TUBE HAVING AN IMPROVED ELECTRON GUN WITH EXPANDED LENSES.

4.317,083. BIAS ADJUSTMENT RESPONSIVE TO SIGNAL POWER.

4,317,110. MULTI-MODE CIRCUIT.

4,317,122. DUOPYRAMID CIRCULARLY POLARIZED BROADCAST ANTENNA.

4,317,133. TWO-LOOP HORIZONTAL AFPC SYSTEM.

4,317,140. STOP AND VARIABLE-SPEED MOTION ON SEGMENTED-SCAN TAPE RECORDING.

4,317,152. A.C. POWER LINE ASSEMBLY.

4,317,192. HEAD SUSPENSION VELOCITY CONTROL APPARATUS FOR ELECTROMECHANICAL RECORDER.

4,317,206. ON LINE QUALITY MONITORING.

4,317,223. RF GENERATOR MONITOR CIRCUIT.

4,317,225. CHANNEL IDENTIFICATION APPARATUS USEFUL IN A SWEEP TYPE TUNING SYSTEM.

4,313,782. METHOD OF MANUFACTURING SUBMICRON CHANNEL TRANSISTORS.

4,313,809. METHOD OF REDUCING EDGE CURRENT LEAKAGE IN N CHANNEL SILICON-ON-SAPPHIRE DEVICES.

4,313,971. METHOD OF FABRICATING A SCHOTTKY BARRIER CONTACT.

4,314,166. FAST LEVEL SHIFT CIRCUITS.

4,314,273. CHROMINANCE TRANSCODER.

4,314,277. INPUT-WEIGHTED TRANSVERSAL FILTER TV GHOST ELIMINATOR.

4,314,546. ARRAY POSITIONING SYSTEM.

4,314,763. DEFECT DETECTION SYSTEM.

4,315,269. THICK PROTECTIVE OVERCOAT LAYER FOR OPTICAL VIDEO DISC.

4,315,277. NON-LINEAR APERTURE CORRECTION CIRCUIT HAVING A SIGNAL BYPASS ARRANGEMENT.

4,315,314. PRIORITY VECTORED INTERRUPT HAVING MEANS TO SUPPLY BRANCH ADDRESS DIRECTLY.

4,315,358. METHOD FOR THE MANUFACTURE OF CAPACITIVE PICKUP STYLE.

4,315,782. METHOD OF MAKING SEMICONDUCTOR DEVICE WITH PASSIVATED RECTIFYING JUNCTIONS HAVING HYDROGENATED AMORPHOUS REGIONS.

4,316,049. HIGH VOLTAGE SERIES CONNECTED TANDEM JUNCTION SOLAR BATTERY.

4,316,058. SOUND FIELD TRANSMISSION SYSTEM SURROUNDING A LISTENER.

4,316,117. BASEPLATE ASSEMBLY FOR FLAT PANEL DISPLAY DEVICES.

4,316,118. GUIDED BEAM DISPLAY DEVICE.

4,316,119. TILTED UNITARY DEGAUSSING COIL ARRANGEMENT.

4,316,126. COLOR TELEVISION PICTURE TUBE WITH COLOR-SELECTION STRUCTURE AND METHOD OF OPERATION THEREOF.

4,316,128. TELEVISION RECEIVER FOCUS VOLTAGE CIRCUIT.

4,316,143. SPEED DEVIATION DETECTOR FOR SERVO CONTROLLED DISC MASTERING TURNTABLE.

4,316,159. REDUNDANT MICROWAVE SWITCHING MATRIX.

4,316,166. SELF-CONVERGING DEFLECTION YOKE AND WINDING METHOD AND APPARATUS THEREFOR.

4,316,177. DATA CLASSIFIER.

4,316,210. VIDEO SIGNAL PROCESSING APPARATUS.

4,316,211. COLOR KINESCOPE CONVERGENCE MEASURING SYSTEM.

4,316,212. METHOD FOR ADJUSTING THE BIAS OF A KINESCOPE IN A COLOR TELEVISION RECEIVER AND APPARATUS TO FACILITATE SAME.

Patent Suits

Notices under 35 U.S.C 290; Patent Act of 1952

2,985,648, Beecham Group Ltd., ALPHA-AMINOBENZYLPENICILLINS; **3,157,640,** Bristol-Myers Co., D-(-)-A-AMINOBENZYLPENICILLIN TRIHYDRATE, **filed** Nov. 17, 1981, D.C. District of Columbia (Wash.D.C.), Doc. 81-2769, *Premo Pharmaceutical Laboratories, Inc.* v. *Bristol-Myers Co., et al.*

3,022,994, Robert Elkund, ELECTROMAGNETICALLY OPERATED HOLDING DEVICES, **filed** Apr. 17, 1981, D.C. Mont. (Butte), Doc. CV-81-34-BU, *Robert Eklund* v. *General Electric Co., et al.* Notice of Voluntary Dismissal by Plaintiff as to defendant General Electric Co., with prejudice filed Jan. 11, 1982.

3,031,450, Boehringer Ingelheim G.m.b.H., SUBSTITUTED PYRIMIDO-[5,4-D]-PYRIMIDINES, **filed** Jan. 31, 1979, D.C.N.J. (Newark), Doc. 79-358, *Boehringer Ingelheim G.m.b.H.* v. *Pharmadyne Laboratories, Inc.* Consolidated with Civil 79-738 (*Boehringer Ingelheim, et al.* v. *Premo Pharmaceutical Laboratories, Inc., et al.*) for all purposes. Filed Mar. 4, 1980. **Same, filed** Aug. 24, 1981, D.C.N.J. (Newark), Doc. 81-2704, *Boehringer Ingelheim International* v. *Barr Laboratories, Inc.* Order for permanent injunction filed Feb. 11, 1982.

3,056,836, Hendrik Durk Moed, et al., ARALKYLAMINES AND METHODS OF PREPARATION THEREOF, **filed** June 20, 1979, D.C.N.J. (Newark), Doc. 79-1757, *Mead Johnson & Co., et al.* v. *Pharmadyne Laboratories, Inc.* Order of dismissal of action filed Jan. 20, 1982.

3,157,640. **(See 2,985,648.)**

3,236,709, Bandag, Inc., TIRE RECAPPING PROCESS, **filed** Dec. 2, 1981, D.C. Minn. (Minneapolis), Doc. 4-81-Civ-832, *Bandag, Inc.* v. *Tri-State Tire Co., Inc.*

3,239,074, Pullman, Inc., RAILWAY CAR UNCOUPLING DEVICES, **filed** Dec. 23, 1981, D.C.,

N.D. Ill. (Chicago), Doc. 81 C 7188, *Nordek Corp.* v. *Garbe Iron Works, Inc., et al.*

3,247,893, Kirsch Co., STRUCTURAL DEVICE, **filed** Feb. 2, 1982, D.C., M.D. Fla. (Orlando), Doc. 82-58-Orl-Civ-R, *Walter B. Sims* v. *Kirsch Co.*

3,306,086, Charles G. Hallgren, GARAGE DOOR LOCKS, **filed** Nov. 13, 1981, D.C., S.D. Fla. (Miami), Doc. 81-2518-Civ-JE, *Keystone Consolidated Industries, Inc.* v. *DNS Industries, Inc.*

3,339,478, Rodney M. Crow, DISPOSABLE SHISH-KEBAB HOLDER, **filed** Jan. 5, 1982, D.C., S.D.N.Y., Doc. 82 CIVIL 00048, *Gemveto Jewekty Co., Inc.* v. *Jeff Cooper, Inc., et al.*

3,355,825, Root Spring Scraper Co., BLADE POSITION LOCK AND RELEASE SYSTEM FOR ROAD SCRAPERS, **filed** Nov. 30, 1981, D.C., W.D. Mich. (Kalamazoo), Doc. K81-420CA8, *Root Spring Scraper Co.* v. *Inland Lake Machine, Inc.*

3,359,661, Toro Mfg. Co., POWERED IMPLEMENT, **filed** Apr. 4, 1978, D.C. Del. (Wilmington), Doc. 78-126, *The Toro Co.* v. *Allis-Chalmers Corp.* Stipulation of dismissal with prejudice filed Dec. 11, 1981.

3,391,420, Amerock Corp., HINGE, **filed** Nov. 16, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 5850, *Amerock Corp.* v. *Crown Sales, Inc., et al.* **Same, filed** Nov. 16, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 5851, *Amerock Corp.* v. *S. Wagner & Co., Inc.*

3,396,542, Construction Techniques, Inc., METHOD AND ARRANGEMENTS FOR PROTECTING SHORELINES; **3,396,545, same,** METHOD OF FORMING CONCRETE BODIES, **filed** Jan. 15, 1982, D.C., E.D. Mich. (Detroit), Doc. 82-70180, *Construction Techniques, Inc.* v. *Holloway Construction Co., Inc.*

3,396,545. (See 3,396,542.)

3,403,868, The Gates Rubber Co., MAGNETIC TAPE CARTRIDGE SYSTEM, **filed** July 21, 1981, D.C., S.D.N.Y., Doc. 81-Civ-4514, *The Gates Rubber Co.* v. *Mastro Industries, Inc.*

3,416,984, Sealed Air Corp., METHOD AND APPARATUS FOR MAKING CELLULAR MATERIAL FROM THERMOPLASTIC SHEETS, **filed** Sept. 27, 1980, D.C. Mass. (Boston), Doc. 80-2185-Z, *Sealed Air Corp.* v. *Packaging Industries, Inc.* **Same, filed** Nov. 13, 1979, D.C., N.D. Calif. (San Francisco), Doc. C79 3283 WAI, *Sealed Air Corp.* v. *USA Polyinternational, Inc., et al.* Order dismissing complaint and first counterclaim filed July 8, 1981. **Same, filed** Apr. 10, 1981, D.C.N.J. (Newark), Doc. 81-1025, *Sealed Air Corp.* v. *Canadian Tarpoly Co.* Order of dismissal of action filed Jan. 7, 1982.

3,434,165, Francis X. Keane, HOSPITAL BED; **4,175,550,** Leininger and Vrzalik, THERAPEUTIC BED, **filed** July 22, 1981, D.C., N.D. Ga. (Atlanta), Doc. C81-1398A, *Kinetic Concepts, Inc.* v. *Southern Medical Supply Co., et al.* **Same, filed** Oct. 5, 1981, D.C., N.D. Ga. (Atlanta), Doc. C81-1823A, *Kinetic Concepts, Inc.* v. *Delta Machine Products, Inc.*

3,442,732, Signode Corp., FRICTION-FUSION STRAP SEALING, **filed** Dec. 14, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 6976, *Signode Corp.* v. *Weld-Loc Systems, Inc.*

3,458,808, Nils Bertil Agdur, APPARATUS FOR MEASURING THE PROPERTIES OF A MATERIAL BY PERSONANCE TECHNIQUES, **filed** Dec. 11, 1981, D.C.N.J., (Newark), Doc. 81-3827, *Technology Marketing, Inc.* v. *Skandinaviska Processinstrument AB, et al.*

3,459,199, Jerry F. Connell, TEASING AND UNSNARLING IMPLEMENT, **filed** Apr. 2, 1981, D.C., N.D. Ala. (Birmingham), Doc. 81-C-0496-M, *Jerry F. Connell, et al.* v. *Sears-Roebuck and Co., et al.* **Same, filed** Apr. 29, 1981, D.C., N.D. Ga. (Atlanta), Doc. C81-796A, *Jerry F. Connell, et al.* v. *The Gillette Co.* Stipulation and Order of Dismissal filed Jan. 19, 1982.

3,460,628, Bendix Corp., LAMINATED TENSION-TORSION TIE-BAR, **filed** Dec. 22, 1981, D.C., W.D. Pa. (Erie), Doc. 81-320 ERIE, *Lord Corp.* v. *The Bendix Corp.*

3,508,406, Armco Steel Corp., COMPOSITE ARCH STRUCTURE, **filed** Sept. 22, 1978, D.C., S.D. Ohio (Cincinnati), Doc. C-1-78-602, *Armco, Inc.* v. *Republic Steel Corp.* Judgment entered for plaintiff and against defendant. Defendants hereby enjoined from infringing plaintiff's patent. Filed Dec. 10, 1981.

3,552,499, Spencer B. Maurer, ROTARY POWER TOOL CLUTCH MECHANISM, **filed** Dec. 1, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 6081, *Upneumat International, Inc.* v. *Gil-Wal International, Inc., doing business as Allied International, Inc.* **Same, filed** Dec. 30, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 6454, *Upneumat International, Inc.* v. *Allied Wholesale, Inc., doing business as Allied International, and Ron Newburg.*

3,571,545, Controls Co. of America, TOGGLE SWITCH WITH PIVOTAL SHORTING BAR BRIDGING STATIONARY CONTACT PINS, AND SLIDABLE CAM BLOCK DETENT MEANS, **filed** Dec. 11, 1981, D.C., M.D. Pa. (Scranton), Doc. 81-1412, *Edward H. Key* v. *Edward G. Haderer and Controls Co. of America.*

3,601,923, Bruce L. Rosenberg, AMUSEMENT DEVICE EMPLOYING DILATANT SUSPENSION FILLER, **filed** Jan. 22, 1982, D.C., S.D. Ohio (Cincinnati), Doc. C-1-82-0046, *Bruce L. Rosenberg* v. *CPG Products Corp.*

3,609,300, John W. Halpern, AUTOMATIC FARE CHARGING DEVICE, **filed** Nov. 24, 1981, D.C. District of Columbia (Wash., D.C.), Doc. 81-2853, *John W. Halpern* v. *Washington Metropolitan Area Transit Authority.*

3,611,035, Minnesota Mining & Mfg. Co., GROUND FAULT PROTECTIVE SYSTEM HAVING GROUNDED NEUTRAL PROTECTION, **filed** Sept. 14, 1979, D.C., E.D.N.Y. (Brooklyn), Doc. 79C 2365, *Leviton Mfg. Co., Inc.* v. *3M Co., also known as Minnesota Mining & Mfg. Co.*

3,611,035, Minnesota Mining & Mfg. Co., GROUND FAULT PROTECTIVE SYSTEM HAVING GROUNDED NEUTRAL PROTECTION; **3,836,821, same,** GROUND FAULT PROTECTIVE SYSTEM, **filed** Sept. 12, 1980, D.C., N.D. Ill. (Chicago), Doc. 80 C 4907, *Minnesota Mining & Mfg. Co.* v. *General Electric Co.* **Same, filed** Sept. 12, 1980, D.C., N.D. Ill. (Chicago), Doc. 80 C 4909, *Minnesota Mining & Mfg. Co.* v. *Gould, Inc.* **Same, filed,** Apr. 29, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 2393, *Minnesota Mining and Mfg. Co.* v. *Eaton Corp.*

3,637,153, King Instrument Corp., MACHINE FOR SPLICING AND WINDING TAPE INTO A CASSETTE; **3,737,358, same,** SPLICER HEAD ASSEMBLY FOR USE IN SPLICING TAPE TO LEADERS; **3,997,123, same,** AUTOMATIC CASSETTE LOADING MACHINE, **filed** Dec. 15, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81-6301 AAH (Px), *King Instrument Corp.* v. *M. L. Tape Duplicating Co.*

3,654,638, Alice W. Nye, OUTPUT COMMODE PAN, **filed** Aug. 4, 1981, D.C., S.D. Tex. (Houston), Doc. 81-2264, *Alice W. Nye, et al.* v. *Southwest Medical Packaging, Inc., et al.* **Same, filed** Nov. 6, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 6248, *Plast-I-Pan Industries, Inc.* v. *The Kendall Co.* **Same, filed** Dec. 16, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 7031, *Alice W. Nye, et al.* v. *Sage Products, Inc., et al.* **Same, filed** Nov. 6, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 6246, *Sage Products, Inc.* v. *The Kendall Co.* Cause dismissed without prejudice on Feb. 22, 1982.

3,705,737, Construction Forms, Inc., PIPE COUPLING WITH RELEASABLE CONNECTOR, **filed** Jan. 7, 1982, D.C.S.C. (Greenville), Doc. 82-24-3, *Con-*

struction Forms, Inc. v. *URPS Concrete Pumping Accessories, Inc.*

3,715,555, Ray M. Johnson, CIRCULAR WAVEGUIDE MICROWAVE APPLICATOR, **filed** Mar. 28, 1979, D.C., N.D. Calif. (San Francisco), Doc. C-79-671-SW, *Ray M. Johnson* v. *Microdry Corp.* Stipulated dismissal filed Dec. 28, 1981.

3,737,358. (See 3,637,153.)

3,758,935, AMP, Inc., APPARATUS FOR SECURING WIRES TO TERMINALS IN CONNECTORS; **3,845,535, same,** APPARATUS FOR CONNECTING CONDUCTORS TO CONTACT TERMINALS IN AN ELECTRICAL CONNECTOR; **3,859,724, same,** METHOD AND APPARATUS FOR MANUFACTURING ELECTRICAL HARNESSES, **filed** Jan. 15, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 0256, *AMP, Inc.* v. *Molex, Inc.*

3,784,984. (See 3,786,519.)

3,786,519, Gentex Corp., HEADGEAR STRUCTURE; **3,784,984, same; 3,789,427, same, filed** Dec. 11, 1981, D.C.N.J. (Trenton), Doc. 81-3874, *Gentex Corp.* v. *Sonetronics, Inc.*

3,789,427. (See 3,786,519.)

3,805,796, Cordis Corp., IMPLANTABLE CARDIAC PACER HAVING ADJUSTABLE OPERATING PARAMETERS, **filed** Feb. 1, 1982, D.C. Minn. (Minneapolis), Doc. 4-82 Civil 61, *Telectronics Pty., Ltd.* v. *Cordis Corp.*

3,814,296, Colortronic Reinhard & Co., KG, METERING APPARATUS FOR PLASTIC MATERIALS, **filed** Nov. 7, 1980, U.S. Ct. of Appeals (1st Cir., Boston), Doc. 80-1733, *Colortronic Reinhard & Co., KG* v. *Plastic Controls, Inc.* The judgment of the district court as to the ruling of invalidity for obviousness is affirmed. Filed Dec. 8, 1981.

3,814,296, Colortronic Reinhard & Co., KG, METERING APPARATUS FOR PLASTIC MATERIALS; **3,985,345, same,** CONTINUOUS COMPOUNDING AND MIXING APPARATUS, **filed** Oct. 22, 1980, U.S. Ct. of Appeals (1st Cir., Boston), Doc. 80-1698, *Colortronic Reinhard & Co., KG, et al.* v. *Plastic Controls, Inc.* The judgment of the district court as to the ruling of invalidity for obviousness is affirmed. Filed Dec. 8, 1981.

3,833,704, W Bar E, Inc., METHOD OF EXTRACTING A PLURAL LAYERED SHEET, **filed** June 5, 1980, D.C., N.D. Ill. (Chicago), Doc. 80 C 2849, *W Bar E, Inc.* v. *HPM Corp.* Cause dismissed without prejudice on Oct. 29, 1981.

3,835,117, Walaschek & Associates, Inc., RUBBERIZED COAL TAR PITCH EMULSION; **3,897,380, same, filed** Jan. 13, 1982, D.C., W.D. Ky. (Owensboro), Doc. 82-0015-0 (A), *Walaschek & Associates, Inc.* v. *Dennis M. Garvin, et al.*

3,836,821. (See 3,611,035.)

3,845,535. (See 3,758,935.)

3,846,347, Witco Corp., RIGID FOAMS FROM POLYURETHANES AND METHODS AND COMPOSITIONS FOR USE IN THEIR PREPARATION; **4,248,975, same,** A RIGID SHRINK STABLE POLYURETHANE FOAM DERIVED FROM AN ADDUCT OF AN ALKYLENE OXIDE HAVING AT LEAST THREE CARBON ATOMS AND A POLYOL HAVING AT LEAST FOUR HYDROXY GROUPS AND BLOWN WITH A FLUORINATED-CHLORINATED ALKANE, **filed** Aug. 31, 1981, D.C., N.D. Ga. (Atlanta), Doc. C81-1648A, *Witco Corp.* v. *Peachtree Doors, Inc., et al.*

3,846,347, Witco Corp., RIGID FOAMS FROM POLYURETHANES AND METHODS AND COMPOSITIONS FOR USE IN THEIR PREPARATION, **filed** Oct. 16, 1981, D.C., S.D.N.Y., Doc. 81-Civ-6357 WCC, *Mobay Chemical Corp.* v. *Witco Chemical Corp.*

3,851,972, Coulter Electronics, Inc., AUTOMATIC METHOD AND SYSTEM FOR ANALYSIS AND REVIEW OF A PLURALITY OF STORED SLIDES, **filed** Dec. 11, 1981, D.C., N.D. Ill. (Chicago), Doc. 81 C 6941, *Coulter Electronics, Inc.* v. *Smithkline Corp.*

3,857,910, Lois I. Day, OXYGENATOR SUPPORT, **filed** Feb. 16, 1979, D.C., S.D. Ohio (Dayton), Doc. C-3-79-54, *Lois I. Day* v. *Water Cleaning, Inc.* Case dismissed without prejudice on Jan. 29, 1982.

3,858,873, Arthur A. Jones, WEIGHT LIFTING EXERCISING DEVICES; **3,998,454, same,** FORCE RECEIVING EXERCISING MEMBER, **filed** Nov. 18, 1980, D.C., M.D. Fla. (Orlando), Doc. 80-635-CIV-R, *Arthur Jones, doing business as Nautilus Sports/Medical Industries* v. *Ray W. Fox, doing business as Carrollwood Fitness Center.* Order of dismissal filed Jan. 14, 1982.

3,859,724. (See 3,758,935.)

3,871,030, Milaca Mills, Inc., TENNIS PANTY, **filed** Nov. 19, 1981, D.C. Minn. (Minneapolis), Doc. 4-81 Civil 814, *Milaca Mills, Inc.* v. *California Lingerie, Inc., et al.*

3,871,367, Marion E. Miller, PELVIC BRACE, **filed** July 14, 1981, D.C.N.J. (Newark), Doc. 81-2230, *Marion E. Miller* v. *Pope Brace, et al.* Order filed Nov. 17, 1981.

3,897,380. (See 3,835,117.)

3,904,506, Shatterproof Glass Corp., APPARATUS FOR CONTINUOUS PRODUCTION OF SPUTTER-COATED GLASS PRODUCTS; **3,925,182, same, filed** Nov. 17, 1981, D.C., E.D.N.C. (Fayetteville), Doc. 81-79-CIV-3, *Shatterproof Glass Corp.* v. *Libbey-Owens-Ford Corp.*

3,913,520, Berg and Brown, HIGH VACUUM DEPOSITION APPARATUS; **4,107,350, same,** METHOD FOR DEPOSITING FILM ON A SUBSTRATE; **4,210,701, same,** METHOD AND APPARATUS FOR DEPOSITING FILM ON A SUBSTRATE, AND PRODUCTS PRODUCED THEREBY, **filed** Dec. 8, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 6198, *Precision Thin Film Corp.* v. *Plastar Optical Laboratories, Inc., et al.*

3,921,356, Oakwood Mfg., Inc., SYSTEM AND APPARATUS FOR INTERCONNECTING STRUCTURAL MEMBERS, AND METHOD OF UTILIZING SAME; **4,081,940, same;** Reg. No. **1,002,551** (ERECTO-PAT), Oakwood Mfg., Inc.; Reg. No. **1,018,691** (SADDLE GUARD DESIGN), Oakwood Mfg., Inc., **filed** Mar. 21, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-70786, *Oakwood Mfg., Inc.* v. *Novi American, Inc.* **Same, filed** Feb. 22, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-70477, *Oakwood Mfg., Inc., et al.* v. *Cardinal American Corp.* Case transferred to Northern District of Ohio to be consolidated with Case C79-348, now pending in that Court on Apr. 30, 1979.

3,925,182. (See 3,904,506.)

3,926,746, Minnesota Mining & Mfg. Co., ELECTRICAL INTERCONNECTION FOR METALLIZED CERAMIC ARRAYS, **filed** Dec. 15, 1981, D.C., S.D. Calif. (San Diego), Doc. 81-1281-T(M), *Kyocera International, Inc., et al.* v. *Minnesota Mining & Mfg. Co.*

3,942,817, Conrad K. Weiffenbach, EXTENSION FOR CAR FRAME, **filed** Dec. 16, 1981, D.C., N.D. Calif. (San Francisco), Doc. C-81-4688-SW, *Antique & Classic Automotive, Inc.* v. *San Jose Custom Coach Works.*

3,934,274, John H. Hartley, Jr., DEFLATABLE MAMMARY AUGMENTATION PROSTHESIS, **filed** Dec. 17, 1981, D.C., C.D. Calif. (Los Angeles), Doc. CV-81 6357 MML (JRx), *John H. Hartley, Jr., et al.* v. *Minnesota Mining & Mfg. Co., et al.*

3,943,288, Edgar Dale Young, TELEPHONE INCORPORATING BINARY CODED DECIMAL TIME DISPLAY; Reg. No. **997,566** (BINATIME), Edgar Dale Young, **filed** Aug. 15, 1980, D.C., S.D. Ohio (Columbus), Doc. C-2-80-699, *Edgar Dale Young* v. *Media House Corp.* Judgment in favor of plaintiff filed Aug. 5, 1981.

3,985,345. (See 3,814,296.)

3,997,123. (See 3,637,153.)

3,998,454. (See 3,858,873.)

4,016,253, Switzer and Farrington, VACCINE FOR IMMUNIZATION OF SWINE AGAINST BORDETELLA BRONCHISEPTICA INFECTION AND METHOD OF USE, **filed** Sept. 9, 1981, D.C.N.J. (Newark), Doc. 81-2858, *Burns-Biotec Laboratories, Inc.* v. *Beecham, Inc.* Stipulation dismissing action filed Jan. 8, 1982.

4,079,225, Allan S. Warner, FIBER OPTIC/PHOTON DETECTOR FOR BRAZING MACHINE; **4,224,496,** Riordan and Mangan, METHOD AND APPARATUS FOR CONTROLLING A BRAZING MACHINE, **filed** Jan. 25, 1982, D.C.N.J. (Newark), Doc. 82-208, *Joyal Products, Inc.* v. *Irtronics, Inc.*

4,081,940. (See 3,921,356.)

4,087,570, Richard E. Beinbrech, METHOD OF MAKING MEDALLION-LIKE ARTICLES AND LENSES; **4,100,010,** Robert E. Waugh, METHOD FOR MAKING DECORATIVE EMBLEMS; **4,139,654,** Robert W. Reed, MEDALLION-LIKE ARTICLES, LAMP LENSES AND METHOD FOR THEIR MANUFACTURE; **4,259,388,** Robert W. Reed, MEDALLION-LIKE ARTICLES, LAMP LENSES AND METHOD FOR THEIR MANUFACTURE, **filed** Feb. 3, 1982, D.C., E.D. Tenn. (Knoxville), Doc. 3-82-68, *The D. L. Auld Co.* v. *John Brichetto, doing business as Autosport Medallions.*

4,100,010. (See 4,087,570.)

4,107,350. (See 3,913,520.)

4,136,125, Hooker Chemicals & Plastics Corp., PREPARATION OF BIS (PENTACHLOROCYCLOPENTADIENYL), **filed** Feb. 8, 1982, D.C., W.D.N.Y. (Buffalo), Doc. CIV-82-110C, *Zoecon Corp. and Hooker Chemicals & Plastics Corp.* v. *Sathon, Inc., et al.*

4,139,654. (See 4,087,570.)

4,175,550. (See 3,434,165.)

4,209,875, Pugh and Shifflett, Jr., CORDLESS VACUUM CLEANER BOWL AND FILTER SYSTEM; **D. 257,661,** Carroll Melvin Gantz, PORTABLE VACUUM CLEANER, **filed** Dec. 23, 1981, D.C. Md. (Baltimore), Doc. HM-81-3299, *Black & Decker (U.S.), Inc., et al.* v. *Hiraoka & Co. (H.K.), Ltd.*

4,210,701. (See 3,913,520.)

4,213,279, Richard C. Layne, DOCK SEAL FOR BUILDING DOORWAY, **filed** Nov. 10, 1980, D.C., S.D. Ohio (Columbus), Doc. C-2-80-949, *Richard C. Layne* v. *Rotary Products, Inc.* Entry of dismissal without prejudice filed on Jan. 8, 1982.

4,213,477, Robert L. Velasquez, AUTOMATIC DAMPER FOR FURNACE VENT PIPE, **filed** Nov. 17, 1981, D.C., E.D. Mich. (Detroit), Doc. 81-74279, *Robert L. Velasquez* v. *Astro Stamping, Inc.* Plaintiff's Pat. No. 4,213,477 is valid. Defendants are permanently enjoined and restrained from further infringing plaintiff's patent. Filed Jan. 25, 1982.

4,224,496. (See 4,079,225.)

4,235,442, Fidelity Electronics, Ltd., ELECTRONIC BOARD GAME SYSTEM, **filed** Dec. 18, 1981, D.C., S.D. Fla. (Miami), Doc. 81-2835-CIV-WMH, *Fidelity Electronics, Ltd.* v. *Tandy Corp., also known as Radio Shack.* **Same, filed** Jan. 8, 1982, D.C., S.D. Fla. (Miami), Doc. 82-0059-CIV-JE, *Fidelity Electronics, Ltd.* v. *Novag Industries, Ltd.*

4,248,975, Witco Corp., A RIGID SHRINK STABLE POLYURETHANE FOAM DERIVED FROM AN ADDUCT OF AN ALKYLENE OXIDE HAVING AT LEAST THREE CARBON ATOMS AND A POLYOL HAVING AT LEAST FOUR HYDROXY GROUPS AND BLOWN WITH A FLUORINATED-CHLORINATED ALKANE, **filed** Nov. 19, 1981, D.C., S.D.N.Y., Doc. 81-Civ-7062 (WCC), *Mobay Chemical Corp.* v. *Witco Chemical Corp.*

4,248,975. (See 3,846,347.)

4,254,166, Glanville and Walters, COMPOSITION FOR REDUCING THE STRENGTH OF ICE, **filed** Jan. 13, 1982, D.C., W.D. Va. (Roanoke), Doc. 82-0030, *American Chemical Co., Inc.* v. *Wen-Don Chemical Co., et al.*

4,259,388. (See 4,087,570.)

4,261,065, Jerald L. Tennant, ARTIFICIAL INTRAOCULAR LENS WITH FORWARD-POSITIONED OPTICS, **filed** Jan. 25, 1982, D.C. Minn. (St. Paul), Doc. 3-82-42, *Precision-Comet Co., Inc. and Jerald L. Tennant* v. *Surgidev Corp.*

4,261,103, Hex International, Inc., TOOL ACCESSORY APPARATUS, **filed** Jan. 19, 1982, D.C., N.D. Ill. (Chicago), Doc. 82C311, *Hex International, Inc.* v. *New York Merchandise Co.* **Same, filed** Jan. 28, 1982, D.C., N.D. Ill. (Chicago), Doc. 82C0531, *Hex International, Inc.* v. *E. Fomil & Sons.* **Same, filed** Jan. 28, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 0532, *Hex International, Inc.* v. *Marvel Trading Corp.* **Same, filed** Jan. 28, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 533, *Hex International, Inc.* v. *The Peddler's Nest.* **Same, filed** Feb. 23, 1982, D.C., S.D.N.Y., Doc. 82-Civ-1095 (RO), *Hex International, Inc.* v. *M. B. Daniels & Co.*

4,261,339, Datascope Corp., BALLOON CATHETER WITH ROTATABLE SUPPORT, **filed** Dec. 22, 1981, D.C.N.J. (Newark), Doc. 81-3948, *Datascope Corp.* v. *S M E C, Inc.*

4,272,649, Williams Electronics, Inc., PROCESSOR CONTROLLED SOUND SYNTHESIZER, **filed** Oct. 2, 1981, D.C., S.D.N.Y., Doc. 81-6097, *Williams Electronics, Inc.* v. *Egawa International Co., Ltd.* Defendants are permanently enjoined from infringing plaintiff's patents. Filed Jan. 12, 1982.

4,305,467, Power Lift, Inc., BLOW-OUT PREVENTER LIFT SYSTEM AND METHOD, **filed** Dec. 15, 1981, D.C., W.D. Okla. (Oklahoma City), Doc. 81-1748 D, *Power Lift, Inc.* v. *Lang Tools, Inc., et al.*

4,306,375, Adolph Goldfarb, SELF-POWERED FOUR WHEEL DRIVE VEHICLE, **filed** Dec. 14, 1981, D.C., S.D.N.Y., Doc. 81-Civ-7776, *L.J.N. Toys Ltd.* v. *Schaper Mfg. Co.*

Re. 28,301, Charles J. Havel, HOT ISOSTATIC PRESSING USING A VITREOUS CONTAINER, **filed** Dec. 23, 1981, D.C., W.D. Pa (Pittsburgh), Doc. 81-2284, *Charles J. Havel* v. *Cyclops Corp.*

Re. 28,369, Merck & Co., Inc., RING A UNSATURATED-20-OXO-11, 17-BIS-OXYGENATED 16-METHYL STEROIDS OF THE PREGNANE SERIES, **filed** June 5, 1981, D.C.N.J. (Newark), Doc. 81-1738, *Merck & Co., Inc.* v. *Dell Laboratories, Inc.* Action dismissed on Jan. 5, 1982.

Re. 29,513, Teradyne, Inc., ELECTRICAL CONNECTION APPARATUS, **filed** Dec. 2, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81-6107 MRP (Px), *Teradyne, Inc.* v. *Elco Corp.*

Re. 29,890, Synair Corp., FLAT FREE PNEUMATIC TIRE AND VOID FREE FILLING THEREFOR, **filed** Dec. 11, 1981, D.C. Colo. (Denver), Doc. 81-W-2130, *Synair Corp.* v. *Okner's Home & Auto Co., Inc.*

Re. 30,717, Amerock Corp., QUICKLY ATTACHABLE AND DETACHABLE HINGE ASSEMBLY, **filed** Dec. 8, 1981, D.C., C.D. Calif. (Los Angeles), Doc. 81 6197, *Amerock Corp.* v. *Scovill, Inc.*

D. 224,138, Kenneth Mahler, MAT, **filed** Nov. 20, 1981, D.C., N.D. Ind. (South Bend), Doc. S 81-0400, *Sunfloat Co., Inc.* v. *Sun Searcher Products, Inc., et al.*

D. 236,606, Paccar, Inc., TRUCK CAB; **D. 248,846, same,** TRUCK SLEEPER COMPARTMENT, **filed** Feb. 2, 1982, D.C., N.D. Fla. (Tallahassee), Doc. GCA82-0011, *Paccar, Inc.* v. *Remora Fiberglas Products, Inc.*

D. 243,330, Optyl Corp., EYEGLASS FRAME, **filed** Jan. 13, 1982, D.C., N.D. Calif. (San Francisco), Doc. 82 0332 RHS, *Optyl Corp.* v. *Prestige Optics, Inc.*

D. 243,427, William R. Watts, FRAME FOR A SEAT, **filed** Sept. 9, 1977, D.C. Del. (Wilmington), Doc. 77-343, *William R. Watts* v. *University of Delaware.* Stipulation and Order dismissing complaint, and counterclaims with prejudice filed Jan. 6, 1982.

D. 243,533, A. Copeland Enterprises, Inc., RESTAURANT BUILDING; **Reg. No. 1,107,575** (SIGN DESIGN), A. Copeland Enterprises, Inc.; **Reg. No. 1,107,576** (SIGN DESIGN), A. Copeland Enterprises, Inc.; **Reg. No. 1,107,609** (DESIGN OF HOUSE), A. Copeland Enterprises, Inc.; **Reg. No. 1,112,389** (SIGN DESIGN), A. Copeland Enterprises, Inc.; **Reg. No. 1,112,390** (SIGN DESIGN), A. Copeland Enterprises, Inc., **filed** July 27, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3-79-0969-D, *A. Copeland Enterprises, Inc.* v. *Lamar E. Ozley, Jr., et al.*

D. 245,461, Jack Jones, Jr., SHOULDER WALLET, **filed** Dec. 14, 1981, D.C., C.D. Calif. (Los Angeles), Doc. CV81 6289AWY (Mx), *The Bugatti, Inc.* v. *Leather Goods International.* **Same, filed** Dec. 14, 1981, D.C., C.D. Calif. (Los Angeles), Doc. CV81 6290CBM, (Gx), *The Bugatti, Inc.* v. *Gift Suppliers International.* **Same, filed** Dec. 14, 1981, D.C., C.D. Calif. (Los Angeles), Doc. CV81 6291 AAH (Jrx), *The Bugatti, Inc.* v. *Colombian Imports.*

D. 248,846. **(See D. 236,606.)**

D. 257,505, Howard Miller Clock Co., FLOOR CLOCK, **filed** Nov. 20, 1981, D.C., N.D. Tex. (Dallas), Doc. CA3-81-2064D, *Howard Miller Clock Co.* v. *Zachariah Maples Grandfather Clock Co., Inc.* **Same, filed** Feb. 5, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 718, *Howard Miller Clock Co.* v. *Zachariah Maples Grandfather Clock Co.*

D. 257,661. **(See 4,209,875.)**

D. 258,174, Shane and Shane, THIMBLE, **filed** Feb. 2, 1982, D.C., N.D. Ill. (Chicago), Doc. 82 C 0652, *Koenigswasser Glass Works, Ltd.* v. *August Titi, et al.*

Errata

In the Patent Suits of February 16, 1982, (1015 OG 19) and (1015 TMOG 14) Patent Number 3,773,309 should be 3,733,309.

PATENT NOTICES

Certificates of Correction for the Week of May 11, 1982

Re. 30,600	4,284,177	4,301,288	4,310,380
Re. 30,669	4,284,673	4,301,289	4,310,405
Re. 30,746	4,284,698	4,301,291	4,310,458
3,929,754	4,284,704	4,301,633	4,310,580
4,010,519	4,286,018	4,302,465	4,310,659
4,115,452	4,286,035	4,303,286	4,311,155
4,135,195	4,287,725	4,303,343	4,311,286
4,178,150	4,288,472	4,303,469	4,311,518
4,193,933	4,288,751	4,303,772	4,311,629
4,195,966	4,289,450	4,305,009	4,311,683
4,196,182	4,289,913	4,305,021	4,311,827
4,206,172	4,290,922	4,306,097	4,311,844
4,218,442	4,291,164	4,306,324	4,311,909
4,220,611	4,291,455	4,306,692	4,312,097
4,220,641	4,292,210	4,306,844	4,312,961
4,224,016	4,292,609	4,306,970	4,313,141
4,229,096	4,293,441	4,307,041	4,313,147
4,230,650	4,293,624	4,307,090	4,313,163
4,241,057	4,295,742	4,307,216	4,313,413
4,242,101	4,296,185	4,307,497	4,313,430
4,246,409	4,296,481	4,307,912	4,314,378
4,247,973	4,296,782	4,308,245	4,314,569
4,250,673	4,297,244	4,308,443	4,314,640
4,252,225	4,297,276	4,308,692	4,314,737
4,259,318	4,298,059	4,309,075	4,315,044
4,265,366	4,298,874	4,309,314	4,315,201
4,267,388	4,299,240	4,309,352	4,315,286
4,268,590	4,299,536	4,309,692	4,315,882
4,271,785	4,299,608	4,309,813	4,316,115
4,274,848	4,299,620	4,309,835	4,316,844
4,276,737	4,299,869	4,310,101	4,317,132
4,279,035	4,300,345	4,310,220	4,318,423
4,279,998	4,300,436	4,310,251	4,318,495
4,280,009	4,300,968	4,310,254	4,318,812
4,281,168	4,301,025	4,310,305	4,320,234

Disclaimers

4,191,635.—*Leonard M. Quick,* Naperville, Ill., and *Albert L. Hensley, Jr.,* Munster, Ind. PROCESS FOR THE CRACKING OF HEAVY HYDROCARBON STREAMS. Patent dated Mar. 4, 1980. Disclaimer filed Feb. 25, 1982, by the assignee, *Standard Oil Co.*

Hereby enters this disclaimer to the remaining term of said patent.

4,274,025.—*Mohanlal S. Nerurkar,* Welwyn Garden City, and *Peter G. Knowles,* Luton, England. POLYESTER FILMS CONTAINING SUBSTANTIALLY SPHERICAL PARTICLES USEFUL AS SLOT LINERS. Patent dated June 16, 1981. Disclaimer filed Feb. 19, 1982, by the asignee, *Imperial Chemical Industries Ltd.*

Hereby enters this disclaimer to claims 1–9 of said patent.

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 3, 1982

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-04-80
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-04-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-16-81
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-08-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-26-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	8-05-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-05-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-26-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	5-15-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-11-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-01-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	5-29-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	7-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1982, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,176,314 to 3,181,174, inclusive

Plant Patents ..... Numbers 2,490 to 2,501 inclusive

REISSUES

MAY 11, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,924
CLEANING APPARATUS FOR ELECTROPHOTOGRAPHY

Hajime Katayama; Syusei Tsukada, both of Tokyo; Tadayuki Kitajima, Yokohama, and Tsukasa Kuge, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,859,691, dated Jan. 14, 1975, Ser. No. 361,164, May 17, 1973. Continuation of Ser. No. 693,893, Jun. 8, 1976, abandoned, which is a Reissue of Ser. No. 361,164, May 17, 1973, Pat. No. 3,859,691, which is a continuation of Ser. No. 120,256, Mar. 2, 1971, abandoned. Application for reissue Oct. 19, 1979, Ser. No. 86,439

Claims priority, application Japan, Mar. 10, 1970, 45-20285; Mar. 17, 1970, 45-25511; Mar. 17, 1970, 45-25512; Nov. 24, 1970, 45-103504

Int. Cl.³ G03G *13/16*

U.S. Cl. 15—256.51 **27 Claims**

1. A cleaning apparatus for an electrophotographic copying device wherein an electrophotographic latent image formed on the surface of a photosensitive member is moved past a series of processing stations including a developing station at which said latent image is developed with toner to form a toner image and a transfer station at which said toner image is transferred to copying material, comprising an elastic cleaning blade for removing residual toner from said photosensitive member after transfer of said toner image to said copying material, said residual toner being scratched off in the direction opposite to that of the movement of said photosensitive member, one end of said elastic cleaning blade having a cleaning edge, and holder means for supporting the opposite end of said elastic cleaning blade and disposing said cleaning edge in contact against the surface of said photosensitive member, said holder means disposing said elastic cleaning blade relative to said photosensitive member to engage a substantially upwardly moving surface portion of said photosensitive member, said elastic cleaning blade being placed above the horizontal axis of a rotary member carrying said surface, said holder means disposing said elastic cleaning blade relative to said photosensitive member at an angle θ_1, at the pre-cleaning side, subtended by the axis of the end portion of the blade contacting the photosensitive member with said cleaning edge and a straight line touching the surface of the photosensitive member at the contact point, and at an angle [θ]ϕ_1, at the pre-cleaning side, subtending by the axis of a portion of the blade near said [opposide] *opposite* end which is supported by said holder means and said line, said angles θ_1 and [θ]ϕ_1 satisfying the following relation:

$$\theta_1 > \phi_1 > \pi/2.$$

Re. 30,925
FUEL VAPORIZING COMBUSTOR TUBE

B. Clark Smith, and Gene A. Anders, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 4,188,782, dated Feb. 19, 1980, Ser. No. 860,644, Dec. 14, 1977. Application for reissue Oct. 30, 1980, Ser. No. 202,386

Int. Cl.³ F02C *7/22*

U.S. Cl. 60—733 **28 Claims**

1. A continuous fuel vaporizer tube *assembly* adapted for use in a vaporizing type combustor, said tube including a hollow stem portion with an open end base, a head portion atop said stem and including a hollow leg portion extending laterally from said head portion, the hollow interiors of said stem portions, said head portion, and said leg portion constituting a continuous closed duct with a smooth continuous flow path contour therethrough, said leg portion terminating in a vapor discharge orifice disposed at an acute angle to the axis of said stem portion, and operable to direct the path of a discharged vapor stream at an acute angle away from said stem and thereby displace the vapor stream path away from the base of said stem[.], *the vapor stream impinging upon a plate.*

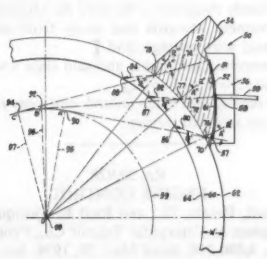
Re. 30,926
ULTRASONIC INSPECTION

Benjamin J. Ross, Cleveland Heights; James M. Toth, Lyndhurst; Richard F. Abramczyk, Brunswick, and Gerald R. Coy, Medina, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Original No. 4,195,530, dated Apr. 1, 1980, Ser. No. 933,668, Aug. 14, 1978. Application for reissue Feb. 5, 1981, Ser. No. 231,758

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—638 **27 Claims**



21. A method for scanning a workpiece having an outer surface including at least a segment which is generally cylindrical and defines an axis, such as a pipe or pipe weld area, said method comprising the steps of:

(a) positioning proximate the workpiece an ultrasonic transducer having an emitting surface shaped such that a plane perpendicular to the axis intercepts the emitting surface along an involute;

(b) pulsing said transducer with an electrical signal for providing an ultrasonic waveform, which waveform impinges upon the exterior surface of the workpiece at substantially equal incident angles nonradially with respect to the workpiece, and

(c) correlating reflections of said waveform from said object with irregularities within said object structure.

Re. 30,927

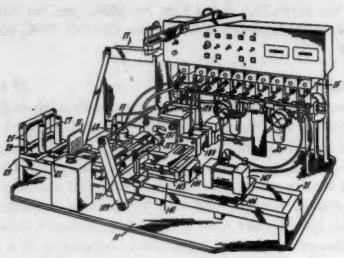
TERMINAL FORMING AND INSTALLING APPARATUS

Maurice H. Brown, 11700 S. Mayfield, Worth, Ill. 60482

Original No. 4,148,237, dated Apr. 10, 1979, Ser. No. 849,848, Nov. 9, 1977. Continuation-in-part of Ser. No. 738,639, Nov. 3, 1976, Pat. No. 4,068,367. Application for reissue Jan. 26, 1981, Ser. No. 228,306

Int. Cl.[3] B26D *7/00*

U.S. Cl. 83—513 5 Claims



1. A wire shearing mechanism for forming at least one terminal from an elongated length of wire, said shearing mechanism including:

a wire die holder,

a channel formed in said wire die holder, **[**

an elongated slot formed in the base of said channel,

a slide positioned in said elongated slot and spring biased towards one end of said slot,

a socket carried by said slide,

an elongated fixed socket formed at the opposite end of said elongated slot,**]**

a wire die removably seated in said channel with a portion thereof extending beyond said wire die holder,

a blade receiving channel formed in the face of the wire die and opening in a direction away from the wire die holder,

at least one wire passage adapted to receive said elongated length of wire formed in the portion of said wire die extending beyond said wire die holder,

an anvil fastened to the wire die adjacent said wire passage,

a blade slidably mounted in the wire die channel for reciprocal movement towards and away from said anvil and across said wire passage, and **[**

means connecting said blade and said slide socket to return said blade from said anvil**]**

means for moving said blade towards and away from said anvil and across said wire passage.

Re. 30,928

ENGINE CONTROL

Joe E. Fuzzell, Peoria, Ill., and Paul E. Turnquist, Lubbock, Tex., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 4,080,940, dated Mar. 28, 1978, Ser. No. 809,344, Jun. 23, 1977. Application for reissue Dec. 2, 1980, Ser. No. 212,294

Int. Cl.[3] F02P *5/04*

U.S. Cl. 123—333 41 Claims

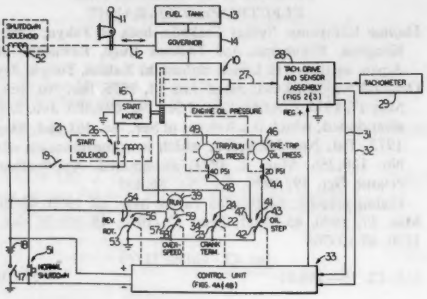
1. Apparatus for controlling the functioning of an engine comprising:

A. a shaft driven by said engine at a speed proportional to the engine speed,

B. means responsive to rotation of said shaft through a predetermined degree of rotational movement for generating a first signal at the beginning of such movement and a second signal at the end of such movement, p1 *C.* timer means for producing a timer signal of predetermined time duration,

D. means for starting said timer in response to generation of said first signal,

E. means for effecting a control function in response to time coincidence of said second signal and said timer signal, *said effecting means including,*



i. a normally reset flip-flop apparatus,

ii. means for setting said flip-flop apparatus in response to said second signal being generated during the existence of said timer signal, and

iii. means for effecting said control function in response to setting of said flip-flop apparatus.

Re. 30,929

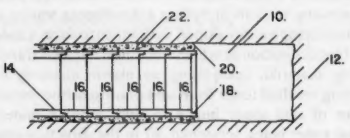
COLLAPSIBLE TUNNEL LINER SECTION AND METHOD OF LINING A TUNNEL

Lembit Maimets, 39 Rivercourt Blvd., Toronto, Ontario, Canada (M4J 3A3)

Original No. 4,124,985, dated Nov. 14, 1978, Ser. No. 837,112, Sep. 28, 1977. Application for reissue Sep. 18, 1980, Ser. No. 188,424

Int. Cl.[3] E21D *5/00;* E01G *5/16*

U.S. Cl. 405—150 13 Claims



1. A collapsible **[**concrete**]** tunnel liner section comprising:

(a) at least six arcuate **[**concrete**]** segments forming, when erected, a closed loop tunnel liner section of predetermined inner diameter,

(b) hinge means hingedly connecting said segments together for movement from a collapsed condition in which said segments are arranged in a compact closed loop stack having an external cross section less in its maximum dimension than said predetermined diameter, through an intermediate position in which said segments are partly erected and have an interior cross section having a maximum dimension greater than said predetermined diameter, to an erected condition in which said segments form said closed loop tunnel liner section, and

(c) **[**expandable air bag**]** *expansion* means within said stack for expanding and thereby expanding said stack from said collapsed condition through said intermediate condition to said erected condition.

PLANT PATENTS

GRANTED MAY 11, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,845

ALMOND TREE

Hashem Naraghi, 17428 Keyes Rd., Denair, Calif. 95316

Filed Jun. 19, 1980, Ser. No. 161,221

Int. Cl.[3] A01H *5/03*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, having general resemblance to the Nonpareil, but distinctively characterized by a prolonged blooming period spanning as much as three weeks; by being an effective pollenizer for the Nonpareil; and by productivity substantially greater than the Nonpareil.

4,846

AFRICAN VIOLET NAMED JACKIE

Arnold W. Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Feb. 26, 1979, Ser. No. 15,356

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new African violet cultivar, substantially as herein shown and described, characterized by its profuse production of dark blue flowers borne as in a bouquet above the foliage on sturdy, erect stems.

PATENTS

GRANTED MAY 11, 1982

ERRATA

For CLASS	See PATENT NO.
307–038	4,328,597
131–180	4,328,795
523–161	4,329,262
525–017	4,329,263
523–162	4,329,264
524–496	4,329,265
523–323	4,329,267
524–166	4,329,268
525–366	4,329,269
524–518	4,329,270
524–386	4,329,271
524–288	4,329,272
524–862	4,329,273
524–862	4,329,274
524–862	4,329,275
524–502	4,329,276
523–122	4,329,277
524–525	4,329,278
524–180	4,329,279
548–519	4,329,286
549–363	4,329,288
549–449	4,329,289
549–316	4,329,290
549–241	4,329,291
549–470	4,329,293
548–549	4,329,556
372–045	4,329,658
372–046	4,329,660
372–046	4,329,661
372–038	4,329,662

PATENTS

GRANTED MAY 11, 1982

ERRATA

PATENTS

GRANTED MAY 11, 1982

GENERAL AND MECHANICAL

4,328,592

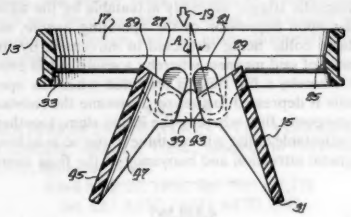
HEART VALVE PROSTHESIS

Jerome J. Klawitter, New Orleans, La., assignor to Hemex, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 64,401, Aug. 7, 1979, abandoned. This application Jan. 14, 1980, Ser. No. 111,488

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 **18 Claims**



1. A heart valve prosthesis comprising an annular valve body having a central passageway therethrough designed to be mounted to permit the flow of blood therethrough in a predetermined downstream direction, and

a pair of leaflets which are supported for substantially pivotal movement on eccentric axes between a closed position blocking blood flow through said central passageway and an open position allowing blood flow therethrough in said predetermined downstream direction,

said annular valve body including a pair of substantially diametrically opposed standards extending from a main portion of said body in said predetermined downstream direction,

said leaflets and said valve body including projecting guides and complementary depressions which receive said guides,

said depressions and said projecting guides mounting said leaflets in a manner to allow pivotal movement relative to said annular valve body,

either said depressions or said guides being located at least partially in said standards so that, in the open position, said leaflets are substantially displaced from the spatial region of said main portion of said annular valve body in a direction downstream of the flow of blood therethrough.

4,328,593

UNIVERSAL JOINT PROSTHESIS WITH CAP

Franz Sutter, Niederdorf, and Fritz Straumann, Waldenburg, both of Switzerland, assignors to Institut Straumann AG, Switzerland

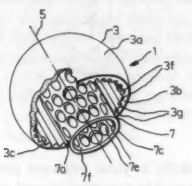
Filed Jun. 6, 1980, Ser. No. 157,278

Claims priority, application Switzerland, Dec. 22, 1979, 11399/79

Int. Cl.³ A61F *1/24*

U.S. Cl. 3—1.91 **14 Claims**

1. A universal joint prosthesis for engaging the head portion of a bone end while retaining the major portion thereof, comprising a cap having a calotte-shaped outer surface terminating in a free edge and an inner surface having a reference osculating surface which is symmetrical about a central longitudinal axis, extending from said free edge defining a concavity in which a bone or the like may be received, the concavity being sufficiently large to contain a major portion of the cancellous bone end of the joint, said inner surface having a plurality of spaced projections, said projections being spaced to define depressions therebetween, said projections and depressions being successively arranged along lines extending from said free edge toward the innermost portion of said inner surface, said lines extending along planes laying in said longitudinal axis, an open ended sleeve attached to said inner surface and arranged coaxially to said axis and extending at least partly beyond the free edge of said concavity and rigidly connected to said cap, said sleeve including a plurality of macroscopic holes extending therethrough, said concavity as well as said



projections and depressions extending from said free edge toward a depth where said inner surface converges toward said axis in a direction away from said free edge, wherein said projections and depressions increase the inner cap surface which can bear on a bone after the prosthesis has been inserted at least 50% with respect to the reference osculating surface that would limit the concavity if the projections and depressions and the sleeve are absent.

4,328,594

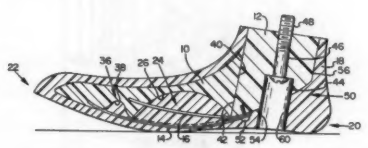
PROSTHETIC FOOT

John W. Campbell, 2599 Rosewood St., and Charles W. Childs, 2880 David La., both of Medford, Oreg. 97501

Filed Feb. 13, 1980, Ser. No. 121,216

Int. Cl.³ A61F *1/08*

U.S. Cl. 3—7 **19 Claims**



1. An elongated resilient keel for a prosthetic foot, said keel having a half dome shaped arch;

said keel also having a bolt block attachment surface posteriorly of said arch and a thinned toe break region extending laterally across the keel and positioned anteriorly of said arch.

4,328,595

INTRAOCULAR LENS

John H. Sheets, 2525 Palo Verde, Odessa, Tex. 79763

Filed Aug. 30, 1979, Ser. No. 71,375

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 3—13 **26 Claims**

1. An intraocular lens assembly for self-centering positioning and support in the lens capsule of the eye solely by interaction of its hereinafter defined flexible wire-like support loops with confronting equatorial surfaces of the lens capsule comprising a lens body, first and second support members extending from the periphery of the lens body for engaging the lens capsule having an overall unstressed diameter greater than the diameter of the lens capsule, at least one of said support members comprising a spring-like flexibly deformable support loop of

elastic wire-like shape extending outwardly from said lens body and including first and second end portions captured in the lens body at first and second attachment locations on the periphery of the lens body, said loop being shaped to provide a first contact foot portion extending a substantial distance outwardly beyond adjacent portions of the support loop and positioned to engage one area of the lens capsule with an outward radial force and a second contact foot portion spaced from the first contact foot portion extending a substantial

distance outwardly beyond adjacent portions of the support loop and positioned to engage a second area of the lens capsule with an outward radial force wherein said first contact foot portion and said second contact foot portion are unsecured to viable body tissue when implanted in the lens capsule and dimensioned and shaped so that they provide substantially the only contact between the support loop and the lens capsule and exert radial and circumferential resilient forces urging the lens to centered position in the lens capsule.

4,328,596

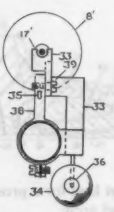
WATER CLOSET FLUSHING VALVE

George H. Renz, 255 Norman Dr., Ramsey, N.J. 07446

Continuation of Ser. No. 866,593, Jan. 3, 1978, abandoned, which is a continuation of Ser. No. 815,318, Jul. 13, 1977, abandoned. This application Jan. 31, 1980, Ser. No. 117,366

Int. Cl.³ E03D *1/14, 3/12*

U.S. Cl. 4—324 **1 Claim**



1. A valve mechanism for a water closet tank having a centrally disposed lifting stem attached thereto and a washer fixedly attached to the upper end thereof, a operating handle, an actuating level, an overflow pipe and a discharge outlet comprising:

a ball-cock valve member engageable around its perimeter in fluid-tight contact with a first valve seat on the top of said discharge outlet;

said ball-cock valve member having a centrally disposed large vertical sleeve which at its lower and communicates with said discharge outlet, a second valve seat at the upper end of said sleeve;

said vertical bore having guide-fins centered at its lower end in said sleeve;

said vertical bore having guide-fins centered at its lower end in said discharge outlet,

a disk-like rubber cap permanently fixed on said vertical lifting stem in fluid-tight contact with said upper valve seat;

a vertically moveable float slidably disposed above said second valve on said lifting stem;

a collar frictionally and adjustably disposed above said float on said lifting stem, said collar serving as an upper stop relative to the vertical movement of said float;

a guide bracket secured to said overflow pipe and having a vertically oriented sleeve to guide the vertical movement of said lifting stem;

a pivotal lifting bracket secured to said actuating lever and engaged with said lifting stem via said washer;

a magnetic trigger assembly pivotally mounted on said overflow pipe, said magnetic trigger assembly having two permanent magnets comprised therein;

said magnetic trigger assembly actuatable by the adjustable collar upon depression of the operating handle, said adjustable collar being restricted in movement by the flux density of said magnets whereby a semi-flush is provided, and whereby a full flush is provided when the operating handle is depressed further to overcome the resistance of the magnetic flux whereby the lifting stem, together with the adjustable collar will continue to rise so as to break the magnetic attraction and buoyancy of the float member.

4,328,597

ADJUSTABLE WASH-BASIN

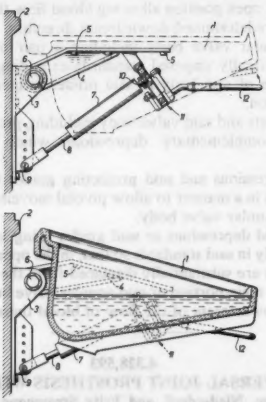
Boris G. R. Bodin, Bromölla, Sweden, assignor to Ifö Sanitär AB, Bromölla, Sweden

Filed Sep. 3, 1980, Ser. No. 183,629

Claims priority, application Sweden, Sep. 14, 1979, 7907650

Int. Cl.³ A47K *1/05;* **E03C** *1/32*

U.S. Cl. 4—644 **4 Claims**



1. A wash-basin arrangement in which the vertical position of a basin is adjustable, comprising:

a basin having an inclined basin bottom and side walls generally upwardly extending from said inclined bottom;

means for mounting the basin on a wall and supporting the basin, said basin having a free end remote from the wall, said mounting means including means for pivotally mounting the basin around a horizontal line substantially parallel with the wall for permitting adjustment of the vertical position of the basin by movement around said horizontal line;

said inclined basin bottom being inclined downwardly from said free end of said basin towards the wall on which said basin is mounted so as to define a depressed area closest to said wall for retaining an adequate amount of water therein for use;

said mounting means further including means for tilting the basin around said horizontal line between an upper operable position of the basin where the top surface defined by

the upper edges of said side walls of the basin is substantially horizontal and the bottom of the basin is inclined downwardly from said free end thereof towards the wall, and a lower, downwardly pivoted, operable position of the basin in which the normally inclined basin bottom is substantially horizontal and said top surface of the basin is downwardly inclined from the wall to said free end of said basin, said adequate amount of water being retained in said basin even when it is inclined downwardly to said lower position; and

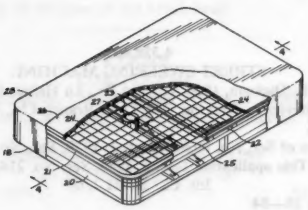
said tilting means including a handle extending substantially to the free end of said basin for actuating said tilting means, said handle being operable by a seated person to pivot said basin between said upper substantially horizontal operable position and said lower downwardly inclined operable position.

4,328,598

MATTRESS FOUNDATION WITH VIBRATOR

Robert Evanson, Spokane, Wash., assignor to Northwest Bedding Co., Spokane, Wash.

Filed May 27, 1980, Ser. No. 153,275
Int. Cl.³ A47C *19/00*; A47D *9/02*
U.S. Cl. 5—401 **8 Claims**



1. A mattress foundation, comprising:

a rigid frame having a continuous horizontal top surface fixed thereto;

a first layer of resilient material overlying the top surface of said frame;

a planar grid freely resting on said first layer of resilient material, said grid being unattached to said frame;

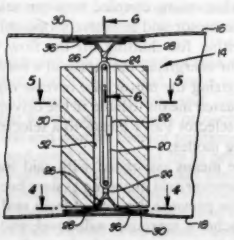
and a powered vibrator unit fixed to said grid, said vibrator unit being physically clear of contact with said frame.

4,328,599

FIRMNESS REGULATED WATERBED MATTRESS

Carlos A. Mollura, 2824 Del Oro Pl., Fullerton, Calif. 92635

Filed Jun. 27, 1979, Ser. No. 52,485
Int. Cl.³ A47C *27/08*
U.S. Cl. 5—451 **1 Claim**



1. A waterbed mattress for use with a waterbed frame comprising:

(a) impervious plastic sheet material forming a top mattress layer and a bottom mattress layer;

(b) a plurality of individual tie structures arrayed about the operative area of the mattress;

(c) each tie structure including a resilient and highly elastic element anchored at opposite ends of the respective mattress layers;

(d) each tie structure having a low spring constant thus to yield as the top layer bulges upwardly under the load of an occupant or under the load of water fill;

(e) each of the elastic elements being stressed when the mattress, peripherally confined by the frame, is filled with water beyond a nominal level whereby said elastic ties impose stress upon the said upper mattress layer resisted by the volume of fluid in the mattress thereby to determine the firmness characteristic of the mattress; and

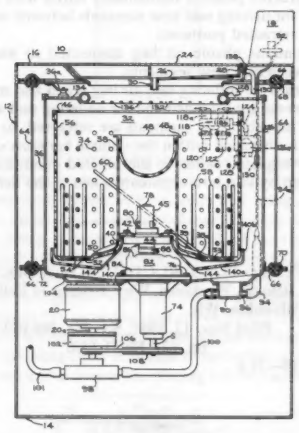
(f) a substantially cylindrical baffle located about the said elastic element of each tie structure, each baffle having a keyhole slot for placement after the tie structure is attached to the top and bottom layers.

4,328,600

WASHING MACHINE

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 39,406, May 15, 1979, abandoned. This application Apr. 23, 1980, Ser. No. 142,949
Int. Cl.³ D06F *23/00, 37/30*
U.S. Cl. 8—159 **72 Claims**



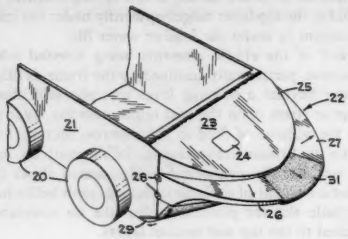
1. A washing machine for fabric articles comprising: a receptacle having a central axis and arranged to receive washing liquid and a fabric article load to be washed by the liquid; means for supplying washing liquid to said receptacle and means for draining liquid from said receptacle, said liquid supply means and said drain means together constituting means effective to maintain the fabric article load in a liquid-soaked condition while accumulating no more liquid in said receptacle than would immerse the lower portion of a full load of fabric articles; drive means connected to said receptacle, said drive means including means to selectively laterally offset the receptacle axis with respect to a predetermined axis so that said receptacle axis moves in direct response to said drive means in a predetermined path about said predetermined axis, said drive means including means for restraining said receptacle from rotating about the receptacle axis during movement of the receptacle axis in the predetermined path; thereby to cause interaction between the wall of said receptacle and the fabric articles for washing the fabric articles.

4,328,601

INFLATABLE BOW

Waldo E. Rodler, Jr., and Howard H. Campbell, both of San Jose, Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Dec. 26, 1979, Ser. No. 106,974
Int. Cl.[3] B63B 7/08
U.S. Cl. 114—353 17 Claims



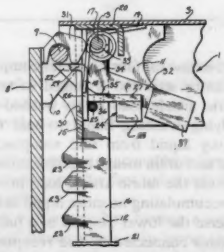
1. A floatable unit, comprising
a substantially watertight hull,
fixed bow structure attached to the forward end of said hull,
left and right movable bow segments attached to said fixed bow structure,
means for pivotally attaching each of said left and right bow segments to said bow structure so that said segments are movable between a laterally located extended position and a retracted position substantially faired with the bow,
means for driving said bow segments between said extended and retracted positions,
a continuous pliable air bag connected to and extending between said bow segments,
and means for inflating said air bag when said movable bow segments are extended and for deflating said air bag when said movable bow segments are retracted, so that said air bag is distended within the volume between said movable bow segments when in the inflated condition and is enclosed by said bow segments when in the deflated condition.

4,328,602

SAFETY LEG CONSTRUCTION FOR A DOCKBOARD

David E. Bennett, Waukesha, Wis., assignor to Kelley Company Inc., Milwaukee, Wis.

Filed Nov. 12, 1980, Ser. No. 206,023
Int. Cl.[3] E01D 1/00
U.S. Cl. 14—71.3 8 Claims



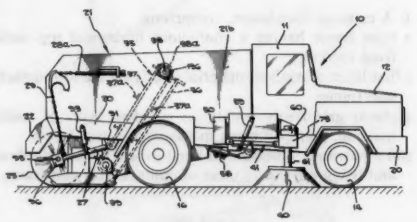
1. In a dockboard, a supporting structure, a ramp structure hinged at its rear edge to the supporting structure and movable from a generally horizontal position to an upwardly inclined position, a lip hinged to the front edge of the ramp structure and pivotable from a downwardly hanging pendant position to an extended position where the lip forms an extension to the ramp structure, a fixed support connected to one of said structures, a leg hinged to the other of said structures at a first pivot and pivotable between an upright ramp supporting position and a retracted inoperable position, biasing means engaged with the leg to bias the leg to the supporting position, a coupling member pivoted to the leg at location spaced from said first pivot, said coupling member having an abutment disposed forwardly of the leg, latch means interconnecting the leg and the coupling member for preventing relative pivotal movement between said leg and said coupling member, a wiper member connected to the lip and engageable with the abutment whereby movement of the lip from the pendant position to the extended position will pivot the coupling member and said leg about said first pivot to move of the leg from the upright supporting position to the retracted position, said latch means including an acceleration responsive element responsive to a predetermined rapid downward acceleration of the ramp structure caused by descent of the ramp structure with an added load thereon for releasing said latch means and disconnecting said coupling means from said leg, whereby the leg will be pivoted to the supporting position by said biasing means independently of the coupling member.

4,328,603

STREET SWEEPING MACHINE

Donald L. Dickson, 1860 Arbolita Dr., La Habra, Calif. 90631, and Steven L. Dickson, 243 Long Branch Cir., Brea, Calif. 90621

Division of Ser. No. 80,532, Oct. 1, 1979, Pat. No. 4,308,632.
This application Dec. 8, 1980, Ser. No. 214,263
Int. Cl.[3] E01H 1/04
U.S. Cl. 15—84 2 Claims



1. In a street sweeping vehicle having a driver's cab, a debris elevating system driven by a hydraulic motor, and brush means for feeding debris to the elevator system, apparatus for energizing the motor and controlling its operation, comprising:
a source of fluid pressure;
selector valve means coupled between said source and the hydraulic motor and selectively operable in one of three modes either for shutting off the flow of energy to the motor, for energizing the motor in a forward direction, or for energizing the motor in a reverse direction;
handle-actuated means located in the driver's cab for switching said selector valve means to a selected one of its three operating modes;
relief valve means associated with said source and responsive, whenever said elevating system becomes jammed, to relieve the pressure developed from said source when the same reaches a maximum safe level; and
visual indicator means visible from the driver's cab and coupled to said relief valve means and responsive to said maximum safe pressure level for indicating that the elevating system is jammed.

4,328,604

TOOTHBRUSHES

Gregory Adams, 708 11th St., Palacios, Tex. 77465

Filed Sep. 8, 1980, Ser. No. 185,225
Int. Cl.[3] A46B 9/04
U.S. Cl. 15—110 1 Claim

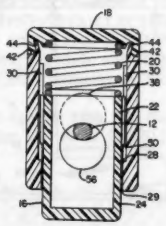
1. A brush for use in brushing of teeth, mouth, and gums comprising:
an elongated handle having a brush head disposed on one end of said handle with two sets of bristles protruding from said brush head;
said first set of bristles being of a length and stiffness suitable for brushing of teeth;
said first set of bristles being attached to or protruding from one surface of the brush head;
said second set of bristles being shorter and softer than said first set of bristles;
and said second set of bristles being attached to or protruding from all surfaces of the brush head.

4,328,605

CORD CLAMP

V. James Hutchison, Lakewood, and Wayne F. Robb, Aurora, both of Colo., assignors to T-Plastech Company, Denver, Colo.

Filed Nov. 9, 1979, Ser. No. 92,994
Int. Cl.[3] F16G 11/04, 11/00
U.S. Cl. 24—115 G 13 Claims



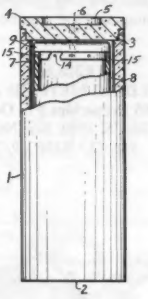
1. A cord clamp comprising:
a hollow sleeve having a pair of opposed holes in facing relationship to one another formed in the surrounding sidewall thereof and including an elongated longitudinal rib on the inner surface of said sidewall in angularly spaced relation to said holes, said sleeve including an inwardly projecting lip surrounding one end and defining an opening of reduced area from the cross-sectional area of said sleeve;
a cap member enclosing the other end of said sleeve;
a plunger member positioned in said sleeve and sized for relative axial movement through said opening, said plunger member having an outwardly projecting shoulder located on a first end portion thereof positioned internally of said sleeve and sized to abut said lip to prevent separation of said plunger and said sleeve, said shoulder having a channel extending in a longitudinal direction for receiving said rib in close-fitting engagement, said channel having a bottom surface formed as an uninterrupted continuation of the exterior sidewall surface of said plunger member, said plunger member having a bore extending transversely therethrough positioned to move into and out of alignment with said holes in a direction normal to the axis of said sleeve and plunger as said plunger member is moved axially in said sleeve between a first position wherein said bore and holes are registered in alignment and a second position wherein said bore and holes are not aligned, said rib defining a continuous guide surface for positively guiding said plunger member throughout its movement in said sleeve; and
bias means in said sleeve for urging said sleeve and said plunger member into said second position.

4,328,606

VERTICAL PLURAL TUBULAR VAULT BURIAL SYSTEM

Abner H. Nunes, 1854 Mahana St., Honolulu, Hi. 96816

Continuation of Ser. No. 651,663, Jan. 22, 1976, abandoned, which is a division of Ser. No. 122,780, Mar. 10, 1971, Pat. No. 3,940,894. This application May 16, 1980, Ser. No. 150,477
Int. Cl.[3] A61G 17/00
U.S. Cl. 27—35 10 Claims



1. A plural vertical tubular vault burial system, comprising a plurality of vertically elongated concrete vaults having substantially horizontal closed bottom ends and being laterally connected to each other in vertical elongated areas extending substantially along an entire vertical length of the vaults, and elongated vertically disposed and laterally confined spaces formed by outer surfaces of adjacent vaults, which spaces are longitudinally coextensive with the vaults, the vaults having upward openings for receiving caskets vertically disposed in the vaults and the spaces between the vaults having upward opening for receiving other materials to be buried, and further comprising end cover means for placing on the vaults.

4,328,607

MANUFACTURING PROCESS FOR FOIL MAGNETIC RECORDING DISKS

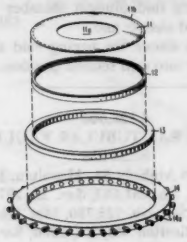
Horst B. W. Denner, and Armin R. Tietze, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1979, Ser. No. 102,161
Int. Cl.[3] B29D 17/00; B23P 11/02
U.S. Cl. 29—169.5 4 Claims

1. A method of fabricating a magnetic recording disk comprising the steps of:
forming a circular foil member of flexible metal,
placing a first ring member inside a second ring member,
placing said first and second ring members inside a compression ring member,
elastically compressing said first and second ring members by the application to said second ring member of compressive force from said compression ring at a plurality of points around the outer periphery of said second ring member,
said second ring member transforming said compressive

force at said plurality of points into a uniform radial compressive force on said first ring,

securing the periphery of said foil member to said elastically compressed first ring member, and



releasing the compression on said first and second ring members to permit said first ring member to elastically expand, thereby tensioning said foil member in a uniform manner.

4,328,608

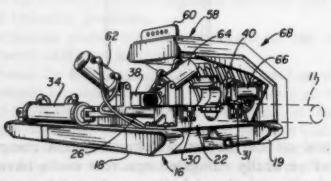
PIPELINE BUILDING METHOD AND APPARATUS

Jack E. Gibson, 4905 Pepperidge Pl., Odessa, Tex. 79762

Filed Jun. 5, 1980, Ser. No. 156,739

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—237 **5 Claims**



1. Apparatus for forcing a marginal end of a pipe joint axially into a marginal end of a pipe coupling wherein said pipe coupling has an inside diameter slightly less than the outside diameter of the pipe joint;

said apparatus includes a main frame; a pipe gripper having a longitudinal bore formed therethrough; said pipe gripper includes a first and second die member movable towards one another for engaging and gripping the external surface of a pipe with great friction, and movable away from one another to release the pipe; means mounting said pipe gripper in supported relationship respective to said main frame;

a coupling holding fixture, means by which said coupling holding fixture is supported respective to said main frame; said fixture having a counterbore which is axially aligned with said longitudinal bore of said pipe gripper, said fixture is spaced from said pipe gripper, said fixture includes a movable member and a fixed member which cooperates together to form the counterbore thereof so that when one member moves towards the other, a pipe coupling is captured in fixed relationship between the members of the fixture;

said main frame includes spaced parallel members and spaced lateral members, said parallel members extend parallel to the axial centerline of the holding fixture and the pipe gripper; said parallel members include means by which they are supported respective to said spaced lateral members; means slidably supported on said parallel members for providing relative movement between said pipe gripper and said fixture along the longitudinal axial centerline thereof;

a hydraulically actuated cylinder assembly supported on said main frame for effecting movement of the means slidably supported on said parallel members;

and control means for actuating said pipe gripper, coupling holding fixture, and hydraulically actuated cylinder;

so that said main frame can be moved along the projected path of a pipeline while joints of pipe are connected together by a coupling member by the action of the apparatus.

4,328,609

MACHINE FOR CUTTING AND REMOVING CORD OR BAND FROM SECURED GOODS

Peter Born, Reutenstrasse 15, CH-4800, Zofingen, Switzerland

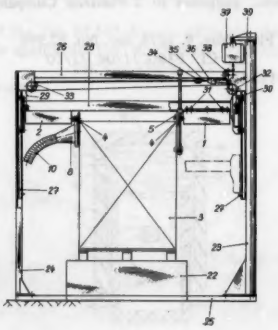
PCT No. PCT/CH79/00008, § 371 Date Nov. 2, 1979, § 102(e) Date Oct. 18, 1979, PCT Pub. No. WO79/00682, PCT Pub. Date Sep. 20, 1979

PCT Filed Jan. 25, 1979, Ser. No. 209,106

Claims priority, application Switzerland, Mar. 2, 1978, 2241/78

Int. Cl.³ B65B *69/00*

U.S. Cl. 29—564.3 **4 Claims**



1. A machine for cutting and removing cord or band extending in a plane and surrounding a number of discrete packages placed on a pallet extending in a place substantially parallel to that cord or band, comprising

a portal stand;

a vertically adjustable horizontal cross beam connected to said portal;

adjusting means for adjusting the vertical position of that cross beam;

conveyor means carrying said pallet through that portal stand;

cutter means for cutting said cord adjustably carried by said cross beam;

a feeler device attached to that cutter means;

biasing means biasing said feeler device toward the center of that cross beam;

a suction device adjustably carried by said cross beam spaced from said cutter means for automatically sucking in and removing said cut pieces of cord or band;

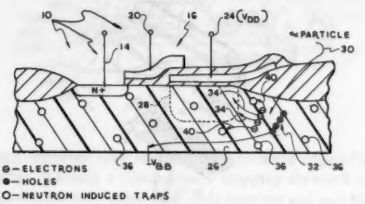
a second feeler device attached to said suction device; and

a second biasing means biasing said second feeler device towards said center of said cross beam.

4,328,610
METHOD OF REDUCING ALPHA-PARTICLE INDUCED ERRORS IN AN INTEGRATED CIRCUIT

Charles E. Thompson, Carlsbad, and Roger G. Newell, La Jolla, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 25, 1980, Ser. No. 143,867
Int. Cl.³ H01L *7/54, 21/263*
U.S. Cl. 29—571 **10 Claims**



1. In the manufacture of integrated circuit packages, the steps of:

providing a semiconductor substrate,

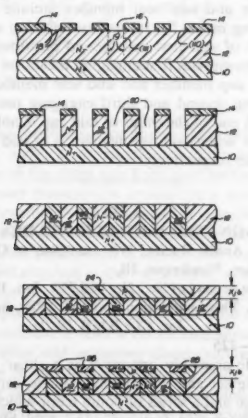
forming in said substrate capacitance means for receiving electron charges functional in the operation of said integrated circuit, and

irradiating said substrate with neutrons to form electron traps in said substrate to prevent unwanted charges produced in said substrate by alpha-particle radiation from entering said capacitance means.

4,328,611
METHOD FOR MANUFACTURE OF AN INTERDIGITATED COLLECTOR STRUCTURE UTILIZING ETCH AND REFILL TECHNIQUES

Alan L. Harrington, Glendale, and Richard Allison, Los Angeles, both of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed Apr. 28, 1980, Ser. No. 144,672
Int. Cl.³ H01L *21/20, 21/74*
U.S. Cl. 29—580 **13 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of:

forming a plurality of grooves through a high resistivity silicon layer which is disposed on a highly doped silicon substrate of the same type conductivity as said high resistivity silicon layer;

filling said grooves with low resistivity silicon of the same type conductivity as said substrate such that alternating regions of high and low resistivity extend upward from said substrate;

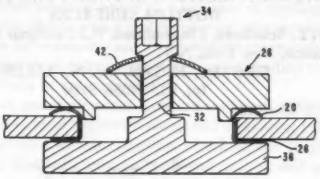
diffusing dopant of a type opposite to that of said substrate partially into said high and low resistivity regions to form the base of said semiconductor device;

diffusing dopant of a type opposite to that of said base into said base at a plurality of discrete locations which are above said low resistivity regions, thus forming a plurality of emitters.

4,328,612
TRIM BEZEL INSTALLATION TOOL

Philip W. Leistra, Jr., Madison Heights, and Robert M. Barnes, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1980, Ser. No. 161,160
Int. Cl.³ B23P *19/00, 11/00*
U.S. Cl. 29—802 **3 Claims**



1. A bezel installation tool for blind securing bezels and eyelets in an aperture in a panel by deforming and clenching bezel and eyelet fastening flanges on an inside surface of said panel surrounding said aperture comprising a bezel and eyelet holder forming an anvil, said holder having an aperture therethrough, a striker having a mandrel mounted in said holder aperture and axially movable therein, a rotating tool connecting device on an end of said mandrel opposite from said striker and a load spring engaging said tool connecting device and said holder preloading said striker against said bezel and eyelet fastening flanges when one of them is placed in the panel aperture and the tool is in position with the striker placed inside the panel whereby rotation of the striker by a tool connected to the striker through said connecting device rotates said striker against the flanges clenching them against said inside panel surface tightly securing the bezel and eyelet to the panel.

4,328,613
CONNECTOR LEAD INSERTION METHOD

Robert J. Kirkpatrick, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

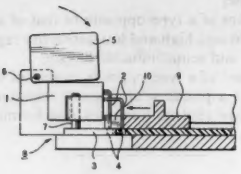
Filed Mar. 27, 1980, Ser. No. 134,512
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—837 **2 Claims**

1. A method of mounting a lead insertion connector (1) having a plurality of leads (2) onto a circuit board (3) having a plurality of lead receiving passageways (4) corresponding to the plurality of leads, comprising the steps of:

engaging individual leads simultaneously with a single comb (9) having individual channels (10) corresponding in spatial orientation to the individual lead receiving passageways,

contacting with said comb at least a portion of each lead on a surface located both furthest from the corresponding lead receiving passageway and proximate to the circuit board to hold that portion of each lead substantially rigid,

sliding the plurality of engaged leads in unison toward and into alignment with the lead receiving passageways by uniplanar movement of the single comb parallel to the circuit board, and



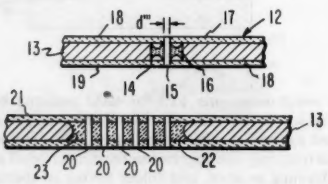
inserting the plurality of leads into the corresponding plurality of lead receiving passageways.

4,328,614

METHOD FOR THE MANUFACTURE OF PORCELAIN COATED METAL BOARDS HAVING INTERCONNECTIONS BETWEEN THE TOP AND BOTTOM SURFACES

Robert L. Schelhorn, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,255
Int. Cl.³ H05K *3/04*
U.S. Cl. 29—842 **7 Claims**



1. An improved method for the manufacture of porcelain coated metal boards of the type having a connector extending through the board from the face to the reverse surface thereof, said method comprising the steps of:

(a) providing a metal core for said board;

(b) forming an aperture through said core at the position wherein said connector is to be provided, said aperture being formed in a predetermined size and of a configuration which is larger than that of said connector;

(c) positioning said connector within said aperture in a spaced apart relationship from the edges of the aperture with the terminal ends of the connector extending beyond the opposite surfaces of the metal core a distance sufficient to at least extend to the face and reverse surfaces of the hereafter to be applied porcelain coating;

(d) inserting a fusible glass frit into the space between the connector and the edge of the aperture, said predetermined size and configuration of the aperture being such that adequate space is provided for the insertion of a sealing effective amount of a fusible glass frit into said space;

(e) heating the assembly of the metal core, connector and fusible glass frit to at least the sintering point whereby the glass frit fuses and seals said connector in the spaced relationship to the metal core;

(f) applying a uniform thickness coating of porcelain frit to the face and reverse surfaces of the metal core and thereafter firing said porcelain;

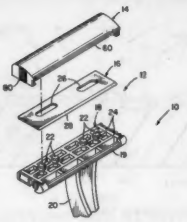
whereby a porcelain coated metal board is obtained having substantially flat surfaces and having a connector extending between the face and reverse surfaces thereof.

4,328,615

RAZOR BLADE ASSEMBLY WITH MOVABLE COVER CAP

Peter Bowman, Sandy Hook, and Allan S. Frieze, Woodbridge, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 31, 1979, Ser. No. 108,747
Int. Cl.³ B26B *21/06*
U.S. Cl. 30—32 **8 Claims**



1. A razor blade assembly comprising:

lower blade supporting means, said lower blade supporting means including a seat member having a skin-engaging guard surface along the forward margin thereof and an upwardly facing planar support surface;

at least one razor blade having a cutting edge;

means rigidly and permanently connecting said at least one razor blade in fixed supported engagement with said planar support surface, said at least one razor blade cutting edge being forwardly directed; and

blade cover means comprising a cap member disposed above said at least one razor blade and having a forward margin and being movably retainedly connected to said seat member, said cap member being movable in a fore-and-aft direction relative to said at least one razor blade and said planar support surface between a first position in which said at least one razor blade cutting edge extends forwardly beyond a plane tangent to forward margins of said cap member for shaving and a second position in which said plane tangent is relatively moved to a position forward of said at least one razor blade cutting edge thereby to effectively remove said at least one razor blade cutting edge from inadvertent external contact wherein said cap member and said seat member include complementary detenting means for releasably retaining said cap member at each of said first and second positions, said detenting means comprises first engaging means on each end of one of said cap member and said seat member for releasably engaging second and third engaging means respectively on each end of the other of said cap member and said seat member when said cap member is in said first and second positions respectively.

4,328,616

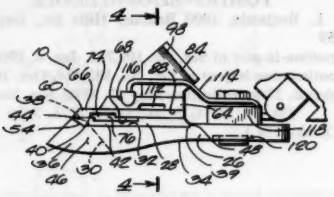
LAMINATED HAIR CLIPPER BLADE SET

Matthew L. Andis, Racine, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 916,511, Jun. 19, 1978, Pat. No. 4,249,307. This application Nov. 23, 1979, Ser. No. 96,784
Int. Cl.³ B26B *19/06*
U.S. Cl. 30—225 **1 Claim**

1. A blade assembly operative as a shear plate for a hair clipper blade set and comprising a blade carrier including a forward edge and a series of comb teeth which are outwardly projecting from said forward edge, said blade carrier also including spaced upper and lower surfaces extending from said forward edge, said forward edge of said blade carrier sloping from said lower surface forwardly towards said upper surface, a blade member having a forward edge and a series of teeth outwardly projecting from said blade member forward edge

and generally overlying said comb teeth when said blade member and said blade carrier are in assembled relation, said blade member also including top and bottom surfaces extending from said forward edge, said forward edge of said blade member slopping from said bottom surface forwardly toward said top



surface and, together with said slopping forward edge of said blade carrier, forming a continuously slopping forward edge for said blade assembly when said blade member and said blade carrier are in assembled relation, and means for securing together said blade carrier and said blade member in assembled relation.

4,328,617

SAFETY BRAKE MECHANISM FOR POWER CHAIN SAWS

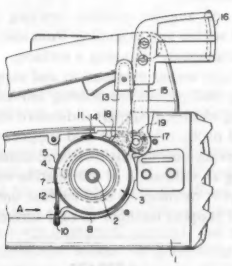
Masatoshi Satoh, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed May 11, 1981, Ser. No. 262,644

Claims priority, application Japan, May 12, 1980, 55-64857[U]

Int. Cl.³ B27B *17/00*

U.S. Cl. 30—382 **2 Claims**



1. A safety brake mechanism for power chain saws comprising a chain saw body, a centrifugal clutch having a drum mounted laterally of the chain saw body and operatively associated with a power transmission system for a saw chain, an actuating drum rotatably disposed around the periphery of said clutch drum, a brake band wound around said clutch drum at least one convolution and hooked at one of ends thereof to the actuating drum and attached at the other end to said chain saw body, spring means for turning said actuating drum clockwise a brake actuating position in which said brake band is tightened around said clutch drum, a reset lever on said actuating drum for manually turning said actuating drum counterclockwise against the action of said spring means to a ready position to produce a spring force in said spring means and to release tension in the brake band, a projection on said actuating drum, a safety lever pivoted to said chain saw body and spring urged counterclockwise around a axis of said pivot and a pawl on said safety lever for engaging said projection on said actuating drum to hold it in the ready position when said actuating drum is turned counterclockwise by the aid of said reset lever.

4,328,618

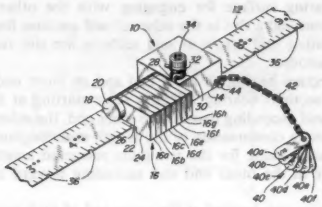
TACTILE MEASURING DEVICE

Robert L. Belanger, 17 Pine St., Waltham, Mass. 02154

Filed Dec. 7, 1979, Ser. No. 101,086

Int. Cl.³ G01B *3/02*

U.S. Cl. 33—125 R **11 Claims**



1. A tactile measuring device comprising:

a measuring rule having indexed units of measure along its length;

a slide member equal in length to a said unit of measure and adapted for sliding along said measuring rule and including means for releasably securing said slide member to said measuring rule at selected positions corresponding to said indexed units of measure; and

a plurality of gauge elements mounted with said slide member for movement therewith along said measuring rule; all of said gauge elements together equalling the length of said slide member along said rule and each of said gauge elements representing an equal increment of measure; said gauge elements being mounted with said slide member for movement between a retracted position and an extended position in which one or more of the gauge elements tactilely represent a measurement along the measuring rule.

4,328,619

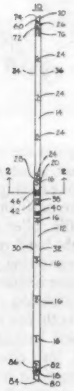
LENGTH AND ANGLE GAUGE

William Lefevre, 46 Roland St., Newton Highlands, Mass. 02161, and Robert P. Darlington, 8 Black Horse Dr., Acton, Mass. 01720

Filed Oct. 20, 1980, Ser. No. 198,626

Int. Cl.³ G01B *3/08, 3/56*

U.S. Cl. 33—161 **1 Claim**



1. A length and angle gauge comprising:

first and second longitudinally aligned and slidably engaging

ruler sections; at least one of said first and second ruler sections including a hollow tube larger than the other section for slidably receiving the other said section; said hollow tube being generally rectangular and including three sides and at least part of a fourth; and said other section also being generally rectangular;

means for releasably securing said sections including a first screw threadably mounted in said hollow tube and having a bearing surface for engaging with the other of said sections and a slot in the other of said sections for accommodating said screw as said sections are slid relative to one another;

each section having an inner end and an outer end, one of said sections bearing a length scale starting at the outer end and ascending toward the inner end, the other section bearing a continuation of the length scale beginning with the scale value for the minimum retracted length of the gauge at the outer end and ascending toward the inner end;

a rotatable arm located at the outer end of each section and having a slanted surface;

means for rotatably mounting said arm to said outer end including a stud on each arm;

means for releasably securing said arm to said outer end including a second screw, an elongate hole in said outer end for receiving said second screw, and threads in said stud for engaging said second screw; and

retraction means including said second screw for enabling said arm to be longitudinally withdrawn within said outer end.

4,328,620

APPARATUS TO REGISTER THE MOVEMENTS OF THE LOWER JAW WITH REFERENCE TO THE SKULL

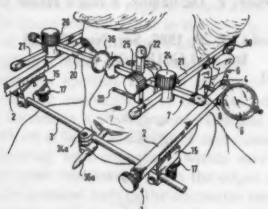
Heinz Mack, Südl. Auffahrtsallee 64, 8000 München 40, Fed. Rep. of Germany, and Günter Singer, München, Fed. Rep. of Germany, assignors to Heinz Mack, München, Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 87,143

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2937750

Int. Cl.³ G01B *3/38*

U.S. Cl. 33—174 D **10 Claims**



1. An apparatus to register the movements of the lower jaw with reference to the skull, substantially comprising an adjustable upper registering yoke having means anchoring the upper yoke to the bridge of the nose and to the cheeks, said means comprising a nasion profile roller, and said upper yoke further having left-hand and right-hand record plates and a reference indicator, and a lower registering yoke which is attached by a plastering through the intermediary of a spoon to the movable lower jaw, said lower registering yoke having a front cross-bar and a pair of side arms, both side arms having holes, a recording and measuring device having a registering stylus being inserted into said holes, into contact against either the said left-hand or the said right-hand record plate at the previously determined hinge axis points of the lower jaw, said device providing continual registration of the movements of the lower jaw in all three planes by recording vertical and horizontal movements thereof, and simultaneously providing movements representing axial displacements of said horizontal movements, and a measuring means responsive to said movements for recording said axial displacement.

4,328,621

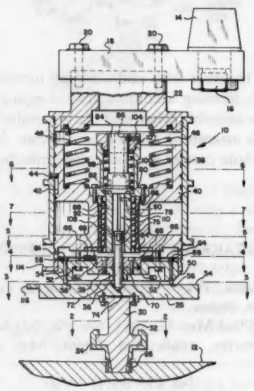
POSITION SENSING DEVICE

Harry L. Benjamin, 1000 Brittany Hills Dr., Dayton, Ohio 45459

Continuation-in-part of Ser. No. 109,722, Jan. 4, 1980, which is a continuation-in-part of Ser. No. 843,414, Oct. 19, 1977, abandoned. This application May 22, 1980, Ser. No. 152,220

Int. Cl.³ B27G *23/00*; G01B *7/18, 7/30*

U.S. Cl. 33—174 L **13 Claims**



1. A position sensing device, comprising:

a support member;

a plurality of angular position sensing probes movably mounted within and extending from said support member for simultaneously engaging a surface;

first transducer means mounted to said support member and engaging said probes for sensing movement thereof and providing electrical signals indicative of the positions of each said probe relative to said support member; and

means receiving said signals from said transducer means and providing an indication of the relative angular position of said support member to said surface and of the distance from said support member to said surface.

4,328,622

APPARATUS FOR MEASURING THE EVENNESS OF A ROAD SURFACE

Ragnar M. Härdmark, and Bror A. S. Hanberger, both of Linköping, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Jul. 7, 1980, Ser. No. 166,782

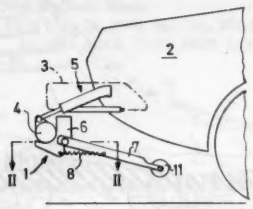
Claims priority, application Sweden, Jul. 10, 1979, 7906019

Int. Cl.³ G01B *7/28, 7/34*

U.S. Cl. 33—174 P **10 Claims**

1. An apparatus for measuring the evenness of a road surface, said apparatus being installed on a vehicle and comprising a plurality of measuring arms each having a free end, means pivotably supporting the arms in side-by-side, uniformly-spaced relationship across the whole width of the vehicle, said free ends of the measuring arms being provided with wheels which engage with the road surface during use of the apparatus, characterized in that each measuring arm is pivotably mounted in a measuring housing rigidly attached to the vehicle and is urged to pivot towards the road surface by means of at last one separate spring, there being provided in the measuring housing a plate spring which is in engagement with structure

movable with the respective arm so that the plate spring deflects in proportion to pivoting of the measuring arm, said plate spring being provided with at least one strain gauge for detect-



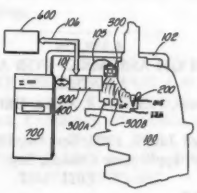
ing said deflection and for generating a signal proportional to said pivotation, there being provided an electronic unit for receiving said signal and for generating in response thereto output data representing the evenness of the road surface.

4,328,623

TELEMETRY GAGE SYSTEM

Richard O. Juengel, Romeo; John D. Begin, Warren, and John Khalaf, Livonia, all of Mich., assignors to The Valeron Corporation, Troy, Mich.

Filed Aug. 28, 1980, Ser. No. 182,226
Int. Cl.³ G01B 7/28
U.S. Cl. 33—174 L **10 Claims**



1. Apparatus for performing in-process gaging of an object undergoing machining at a numerically controlled machine tool comprising:

gaging means having a housing adapted for removable retention in a tool magazine of the numerically controlled machine and for automated selection from the magazine and insertion into a machine tool device movable relative to the object via numerical control, the gaging means including transducer means for generating an electrical signal proportional to displacement of the transducer means caused by a physical characteristic of the object, and means for converting the electrical signal to an infrared optical signal of predetermined frequency,

means for remotely wirelessly receiving and converting the optical signal to a digital signal related to displacement of the transducing means, and

control means responsive to the digital signal to provide a visually perceptible display thereof.

4,328,624

CLAMP FOR MOUNTING TELESCOPIC PISTOL SIGHTS

Cecil J. Ross, El Paso, Tex., assignor to W. R. Weaver Company, El Paso, Tex.

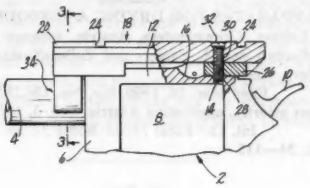
Filed May 14, 1980, Ser. No. 149,799
Int. Cl.³ F41G 1/38
U.S. Cl. 33—245 **3 Claims**

2. A mount assembly for securing an optical gunsight to a handgun, said assembly comprising:

(a) a base member for overlying an upper surface on the handgun;

(b) means for securing a breechward end of said base member to a handgun;

(c) a clamp member having lateral clamping legs arranged to be deflected toward each other to clampingly engage a frame or barrel portion of the handgun, said clamp member also including a bridge portion extending between said clamping legs and underlying said base member;



(d) pressure means overlying said clamp member and engaging opposite side portions of said clamp member above said clamping legs; and

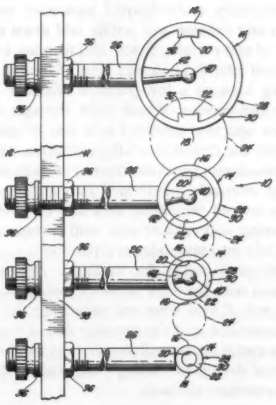
(e) adjustable tightening means engaging said base member and said clamp member for drawing said clamp member toward said base member to cause said pressure means to deflect said clamping legs toward each other.

4,328,625

ARCHERY BOWSIGHT (BETWEEN RANGE)

Richard F. Carella, 35572 Strathcona, Mt. Clemens, Mich. 48043

Filed Mar. 21, 1980, Ser. No. 132,367
Int. Cl.³ F41G 1/46
U.S. Cl. 33—265 **9 Claims**



1. An archery bowsight (10) comprising; support means (12) for attachment generally parallel to the length of an archery bow, a plurality of sights (14) connected to and longitudinally spaced along said support means (12), each of said sights (14) defining an outer longitudinal height (16–18) and a smaller inner longitudinal height (20–22), said outer heights (16–18) being successively smaller from sight to sight, each of said outer longitudinal heights (16–18) being positioned so that the bow will be properly aimed at a target when said outer longitudinal height (16–18) of any one of said sights equals the apparent vertical height of the target, said inner longitudinal heights (20–22) being successively smaller from sight to sight in the same direction as said outer heights (16–18) become smaller, each of said inner longitudinal heights (20–22) being of a dimension so that the bow will be properly aimed when said

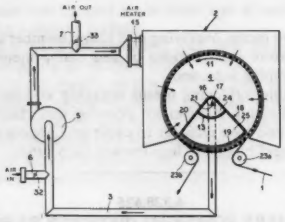
inner longitudinal height (20–22) of any one of said sights (14) is equal to the apparent vertical height of the target and the bow is moved to place the target between that sight having said equal inner longitudinal height and the next smaller sight, said inner longitudinal height of each sight being greater than the outer longitudinal height of the next adjacent smaller sight.

4,328,626

APPARATUS FOR DRYING A FIBROUS WEB

Franz Leitner, Grimmenstein, Austria, assignor to H. Walli Gesellschaft m.b.H. Papier- und Zellstoffwattefabrik, Thomasberg, Austria

Filed Mar. 14, 1980, Ser. No. 130,255
Claims priority, application Austria, Feb. 3, 1978, 779/78
Int. Cl.³ F26B *11/02*; B65H *17/30*
U.S. Cl. 34—115 **5 Claims**



1. An apparatus for drying a wet air-permeable web, comprising:

a drum rotatable about an axis and provided with a peripheral wall having a multiplicity of interstices;

an exhaust pipe extending along said axis;

a substantially sector-shaped stationary casing extending from said exhaust pipe within said drum to the inner surface of said peripheral wall and forming a shield obstructing said interstices along a zone of limited arc length, said casing forming a low-pressure chamber communicating with the interior of said drum through at least one entrance aperture provided in a side of said casing facing against the direction of drum rotation, said exhaust pipe communicating with the interior of said casing, said casing being internally subdivided into an outer compartment close to said peripheral wall and an inner compartment adjoining said exhaust pipe, said entrance aperture opening only into said inner compartment;

external guide means for leading a web to be dried into contact with the outer surface of said peripheral wall near one end of said zone and detaching the web from said outer surface near the opposite end of said zone; and

suction means connected to said exhaust pipe for drawing a flow of drying air through said web, said interstices and said entrance aperture.

4,328,627

ADJUSTABLE SKATING SHOE

Glen D. Sanders, 1372 Sierra Alta Dr., Tustin, Calif. 92680

Filed Dec. 20, 1978, Ser. No. 971,528
Int. Cl.³ A43B *5/04*; B62D *0/00*
U.S. Cl. 36—115 **27 Claims**

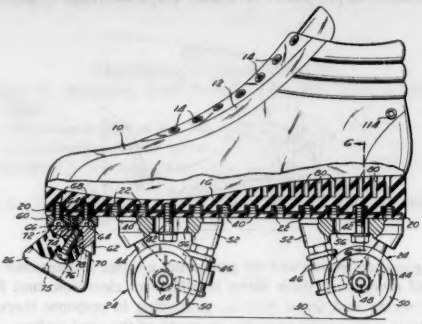
1. A sport shoe adapted to be worn upon the foot of a user comprising:

a foot receiving member;

a resilient sole member attached to said foot receiving member;

a structural beam disposed between opposite surfaces of said sole member and extending along the length of said sole member;

means disposed on said sole member for contacting a support when said shoe is worn by a user; and



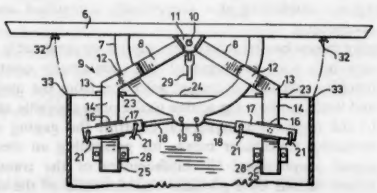
means for selectively attaching said contacting means to said structural beam at plural positions located along the length of said structural beam.

4,328,628

SNOW PLOUGH ASSEMBLY FOR A FRONT END LOADER

Bernard N. Thomas, P.O. Box 8, Alban, Ontario, Canada (P0M 1A0)

Filed Jun. 2, 1980, Ser. No. 155,775
Claims priority, application Canada, Sep. 10, 1979, 335328
Int. Cl.³ E02F *3/62*
U.S. Cl. 37—117.5 **7 Claims**



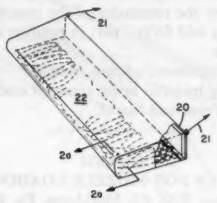
1. A front end loader having a forwardly concave implement, means for elevating the implement, and a snow plough accessory fixed to the implement, the accessory comprising a snow plough blade, a blade-supporting frame comprising a pair of cantilever beams pivotally connected to the rear of the blade about a vertical axis and diverging rearwardly and radially of said axis and then extending rearwardly parallel to each other, the parallel portions of the beam having rearwardly facing channel structures for receiving the lower portion of the implement, a semicircular beam fixed to the rear of the blade concentric with said axis and slidably supported by the radial portions of the cantilever beams, remotely controllable reciprocatable cylinders pivotally supported on the parallel portions of the cantilever. beams and coupled to the semicircular beam to swing the blade about said axis, and a connector arm pivotally connected at one end to the frame adjacent its connection to the blade, the connector arm at its other end being connected to an upper part of the implement.

4,328,629

SHELLFISH DREDGE CHAFING GEAR

Walter J. Bruce, Jr., New Bedford, and Wayne M. Bruce, Dartmouth, both of Mass., assignors to Bruce's Splicing & Rigging Co., Inc., New Bedford, Mass.

Filed Oct. 28, 1980, Ser. No. 201,496
Int. Cl.[3] A01K 73/00; E02F 5/00
U.S. Cl. 37—55 7 Claims



1. A method for providing means for protecting shellfish dredge chain bags from wear caused by dragging on the ocean floor,

said method comprising:

cutting a used vehicle tire into at least one annular ring,

thereafter cutting said ring into a plurality of arcuate strips having a curvature that generally corresponds to the curvature of the original tire section,

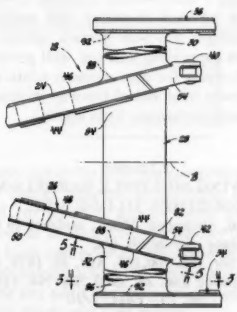
and providing at one end of each said arcuate strip means for attachment of said end to the lower side of a shellfish dredge chain bag.

4,328,630

PULLYOKE ASSEMBLY FOR A SCRAPER

Richard A. Hood, Stow; Dale C. Greig, Willoughby Hills, and Ralph E. Nemecek, Lyndhurst, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1980, Ser. No. 206,616
Int. Cl.[3] E02F 3/62
U.S. Cl. 37—129 3 Claims



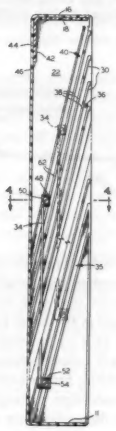
1. In an earthmoving scraper including a pullyoke assembly connected to a tractor and having a pair of rearwardly diverging drawbar members rigidly supporting a transverse torque tube the opposite ends of which are provided with a pair of pull-arms that extend rearwardly for pivotal connection with the side walls of a scraper bowl, the improvement wherein each of said pair of pull-arms comprises a U-shaped bar having elongated legs which extend rearwardly along one side of said scraper bowl; a back-up bar extending between said legs of said U-shaped bar; inner and outer plate members secured to said U-shaped bar and to said back-up bar; said torque tube comprising a central tubular member and a pair of outer tubular members, said central tubular member rigidly interconnecting the lower portions of said pair of drawbar members, each of said pair of outer tubular members having a longitudinal center axis and having a body portion one end of which is flared outwardly and terminates with a peripheral edge located in a plane inclined to said longitudinal center axis and the other end of which is flared outwardly and terminates with a peripheral edge located in a plane substantially perpendicular to said longitudinal center axis; and weld means connecting said peripheral edge of said one end of said body portion to one of said pair of drawbar members and connecting said peripheral edge of said other end of said body portion to said U-shaped bar and said back-up bar of said one of said pair of pull-arms whereby said pair of outer tubular members are axially aligned with said central tubular member and torsional bending stresses imposed by said scraper bowl on said torque tube are distributed along said body portion of each of said pair of outer tubular members.

4,328,631

CARD-RACK ASSEMBLY

Gerhard A. Foerster, Woodbridge, Conn., assignor to Pyramid Technologies, Inc., Meriden, Conn.

Filed Jan. 6, 1981, Ser. No. 222,931
Int. Cl.[3] G09F 1/10
U.S. Cl. 40—373 8 Claims



1. In a card-rack assembly including a pair of elongated spaced-apart side walls, each of which provides first and second longitudinally extending edges, said first and second edges lying generally in first and second substantially parallel planes, respectively, said card-rack assembly further including means supporting said side walls in opposed, spaced relationship and a multiplicity of substantially parallel divider portions supported between said side walls at an acute angle to said common plane, said side walls and the surfaces of adjacent divider portions forming card compartments, at least a plurality of said compartments being open toward said first common plane, said card-rack assembly thereby being permitted to be mounted with said common planes extending vertically and said divider portions inclined downwardly from said first common plane toward said second common plane to permit cards to be received at said first common plane in said card compartments of said open plurality thereof, the improvement wherein:

a. each of said divider portions has an aperture therein with said apertures of said divider portions being aligned at least in part to provide a passage extending through said compartments; and

b. said card-rack assembly further includes:

(i) an elongated stop member disposed in said passage and extending through said compartments substantially

parallel to said first common plane to limit the depth to which cards can be inserted into said compartments, said passage being of substantially greater dimension than said stop member to permit substantial movement of said stop member toward and away from said first common plane; and

(ii) mounting means extending between and engaging opposed faces of at least a pair of adjacent divider portions and supporting said stop member in said passage to provide a compartment depth determined by the position at which said opposed faces are engaged by the mounting means, said mounting means being releasable to permit said stop member to be moved in said passage toward and away from said first common plane, said mounting means further being re-engageable with said opposed faces of said pair of adjacent divider portions to mount said stop member at different positions, the depth of said compartments to which cards can be inserted thereby being adjustable to any value within a limited range.

4,328,632

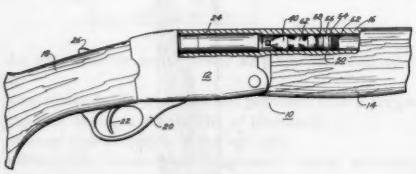
FIREARM CLEANING DEVICE

John W. R. Beers, 1355 Merrifield, Niles, Mich. 49120

Filed Apr. 14, 1980, Ser. No. 139,718

Int. Cl.³ F41C *31/00*; F42B *5/24, 9/22*

U.S. Cl. 42—1 BC **13 Claims**



1. A cleaning device for firearms having a firing pin and a barrel with a shell chamber, comprising a casing for seating in said shell chamber with one end adjacent the firing pin, a cleaning means disposed in the other end of said casing, propellant means consisting of a cylindrical cartridge ejectably disposed in the end of said casing adjacent the firing pin to discharge a gas in said casing for propelling said cleaning means and said cylindrical cartridge through said barrel in contact with the inside walls thereof, when said propellant means is activated by the action of the firing pin, and a pad of soft material disposed around and secured to the sides of said cartridge and surrounded by said casing before the device is activated.

4,328,633

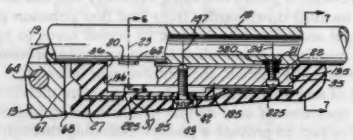
GUN WITH CUSHIONED FOREND

Frank A. Pachmayr, Los Angeles, and Jack R. Farrar, Whittier, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed May 19, 1980, Ser. No. 151,138

Int. Cl.³ F41C *23/00*

U.S. Cl. 42—74 **12 Claims**



1. A gun comprising:

a frame;

a barrel projecting forwardly from said frame;

firing mechanism including a trigger;

a cushioned forend part at the underside of said barrel, forwardly of said trigger, including a body of elastomeric material having outer surfaces deformable to cushion a user's contact therewith, and including reinforcing material stiffer than said elastomeric material and embedded therein for handling of the elastomeric material and reinforcing material together as a unit prior to and during attachment to the remainder of the gun; and

means securing said forend part in position at the underside of the barrel;

said securing means including a fastener;

said reinforcing material being clamped essentially between said fastener and said barrel.

4,328,634

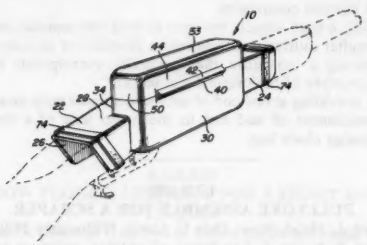
LOCK COVER FOR MUZZLE LOADING RIFLES

James W. Wiltrout, R.D. #1, Markleton, Pa. 15551

Filed Jul. 3, 1980, Ser. No. 166,088

Int. Cl.³ F41C *27/08*

U.S. Cl. 42—1 N **9 Claims**



1. In combination with a stock equipped flint lock mechanism rifle having its flint lock mechanism supported from one side of the rifle stock, an enclosure for said mechanism, said enclosure including a downwardly opening cover supported from said rifle in position enclosing said mechanism from above and including a top wall portion spaced above said mechanism, means supporting said top wall portion from the remainder of said cover for displacement relative to said remainder of said cover to an out-of-the-way position providing ready access to said mechanism from above.

4,328,635

FIREARM HAVING MULTIPLE BARRELS MOVABLE TOGETHER TO ONE SIDE

Osborne Klavestad, Shakopee, Minn., assignor to Olde Savannah Arms Company, Savannah, Ga.

Continuation of Ser. No. 900,155, Apr. 26, 1978, abandoned.

This application Jan. 24, 1980, Ser. No. 114,839

Int. Cl.³ F41C *7/10*

U.S. Cl. 42—12 **3 Claims**

1. In a firearm,

a normally stationary firearm frame having a projecting hinge portion thereon,

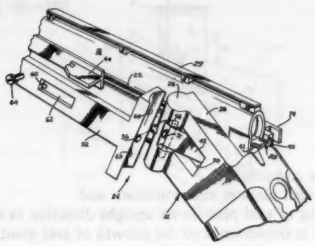
an integral barrel assembly comprising a pair of superposed, coextensive barrels mounted in over and under relationship, said barrels both normally being upright in firing position,

attaching means on one side of said barrels attaching said barrels to said projecting hinge portion about a normally, substantially vertical hinge line whereby said barrels open to one side for loading and unloading,

said attaching means comprising an attaching member having a notch and said frame having a slot therein to receive a portion of said attaching member, there being a lip on

said frame member which fits into said notch when said barrel assembly and said frame are assembled,

a bracket member removably attached to said barrel assembly and having a concave hinge portion thereon engageable with a complementary convex portion of said hinge on said frame, and



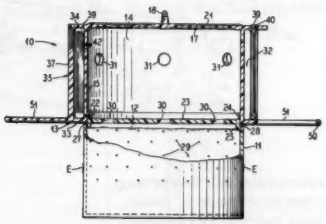
a lug member projecting from said hinge portion on said frame and said concave portion on said bracket having an opening therein into which said lug fits when said hinge is assembled.

4,328,636

DEVICE FOR INSECT CONTROL AND METHOD

Richard D. Johnson, 29 W. Ash St., Lombard, Ill. 60148

Filed Jun. 30, 1980, Ser. No. 164,260
Int. Cl.³ A01M *1/10*
U.S. Cl. 43—107 **15 Claims**



1. An insect coptrolling device comprising:

an insect barrier adapted to intervene between an insect infested environment and an insect incubatory medium attractive to at least a certain species of fertilized female insects from said infested environment;

said barrier having hole means therethrough small enough to preclude any adult insects or developed larva from escaping from inside said hole means;

said hole means being only large enough to receive therethrough from outside of said barrier insect eggs, or tiny newly hatched larva attracted to said medium, and the small size of the hole means assuring that developed larva and insects maturing from the larva from will be trapped inside said barrier against leaving said barrier to enter said environment;

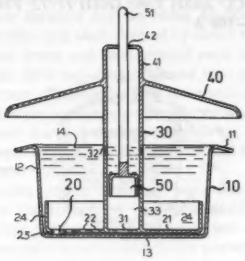
said device comprising a bird feeder wherein said barrier comprises a perforate insect incubatory medium bait cage, and a trap chamber accessible by migration from within said cage to larva or insects maturing from the larva, and means affording access into said trap chamber of bird bills for capturing insects in said trap chamber but precluding insect or larva escape from the trap chamber.

4,328,637

SNAIL TRAP

Karl Eichmuller, Oberriet, and Werner Dubach, Wallisellen, both of Switzerland, assignors to Createchnic Patent AG, Dietlikon, Switzerland

Filed Jun. 4, 1980, Ser. No. 156,322
Int. Cl.³ A01M *1/10*
U.S. Cl. 43—121 **4 Claims**



1. In a snail trap comprising an open-top container having side walls and a bottom defining a space for receiving a liquid, said container being adapted to be inserted into the ground and to receive in said space a liquid which attracts snails, the improvement comprising:

a sieve-like, snail collecting device within said container and resting on the bottom thereof, said device having

a periphery in juxtaposition to said walls,

handle means comprising an upright extending vertically from the center of the device to a level above the top of the container for use in lifting the device out of the container, and includes a cover which projects outwardly beyond said walls and is at an elevation above the top of the container, wherein said upright projects above said cover, and wherein said upright has a hollow interior and a top,

means providing fluid communication between the hollow interior and the space within the container, and

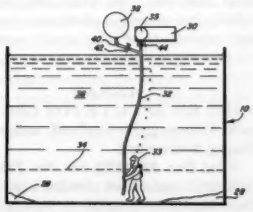
including a float in said interior and having a stem projecting upwardly beyond the top of the upright to serve as a gauge to indicate the level of the liquid in the container.

4,328,638

METHOD OF ELIMINATING MUSSELS AND THE LIKE FROM AN UNDERWATER BED

James A. Smithson, Decatur, Ill., assignor to Illinois Power Company, Decatur, Ill.

Filed Sep. 19, 1980, Ser. No. 188,611
Int. Cl.³ A01N *23/00*
U.S. Cl. 43—124 **29 Claims**



1. The method of eliminating mussels and the like from an underwater bed which comprises;

applying to the zone of at least the bottom 2 feet of water above said bed sufficient water-soluble sulfite salt, having

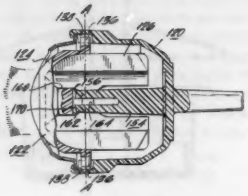
a substantially nontoxic cation, to substantially deplete dissolved oxygen in said zone, and maintaining said conditions until the desired mussel kill is obtained.

4,328,639

VISCOUS FLUID DAMPING SYSTEM

John Cotey, 27 W. End Ave., Haddonfield, N.J. 08033

Filed Nov. 27, 1979, Ser. No. 97,945
Int. Cl.³ A63H *3/40*; G01D *11/12*; F16D *57/00*
U.S. Cl. 46—169 A **9 Claims**



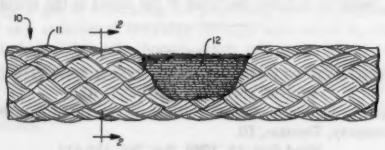
1. A doll eye assembly comprising a housing, an eyeball pivotally mounted in said housing, a projection formed in said housing having a semi-sperical tip portion, the center of which is aligned with the axis of rotation of the eyeball, said eyeball including a portion having an arcuate face conforming to the peripheral trace to the tip of the housing projection and spaced therefrom to define a first capillary zone, a viscous fluid damping material in said first capillary zone providing a damping action upon rotation of the eyeball about the pivot axis and means defining a secondary capillary reservoir in fluid communication with said first capillary zone and of greater capillary dimension than the greatest cross-section of said first capillary zone.

4,328,640

ROPE WICK

William F. Revelle, 3000 Bryant Rd., Mobile, Ala. 36605

Filed Nov. 3, 1980, Ser. No. 203,581
Int. Cl.³ A01M *21/00*
U.S. Cl. 47—1.5 **6 Claims**



1. A rope wick for the selective application by contact of liquid chemical solutions, such as herbicides, to plant foliage in an agricultural crop, said rope wick comprising:
(a) a braided outer covering of abrasion resistant yarn; and
(b) an inner core made of spun acrylic yarn.

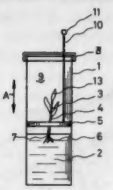
4,328,641

METHOD AND RECEPTACLE FOR GROWING PLANTS

Günter Tesch, Fribourg, Switzerland, assignor to Breveteam S.A., Fribourg, Switzerland

Filed Dec. 12, 1980, Ser. No. 215,916
Claims priority, application Switzerland, Dec. 15, 1979, 11092/79; Sep. 24, 1980, 7148/80
Int. Cl.³ A01G *31/00*
U.S. Cl. 47—59 **42 Claims**

1. In a method of handling and growing a plant with the aid of a container adapted to be partially filled with water and having an inner wall surface disposed in use substantially parallel to an upright axis, and including holding means movable along said inner wall surface between a position near the water level and a position thereabove, engaging the inner wall surface with its outer surface in any of said positions, and adapted to receive at least the stem of the plant,



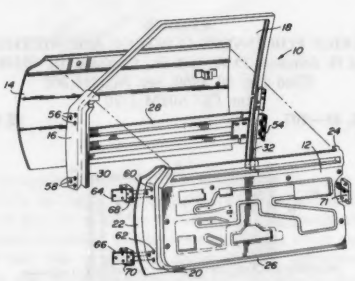
the steps comprising:
holding said plant in said container, and
displacing of said plant in an upright direction in said container in dependence of the growth of said plant.

4,328,642

PLASTIC DOOR FOR AN AUTOMOBILE

Douglas A. Presto, Bensalem, Pa., assignor to The Budd Company, Troy, Mich.

Filed Jun. 9, 1980, Ser. No. 157,460
Int. Cl.³ B60J *5/04*
U.S. Cl. 49—502 **4 Claims**



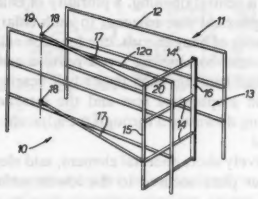
1. An automobile door comprising:
(a) an outer panel made of plastic;
(b) an inner panel made of plastic;
(c) an assembly comprising a metal door frame and a door beam;
(d) said metal door frame including an upper cross member and two downwardly extending leg sections for receiving latch and hinge elements, said door frame having the lower portions of said leg sections positioned between said outer and inner panels having one leg extending along the front edge of said door and the other leg extending along the rear edge of said door and said upper portions of said legs cooperating with said upper cross member for forming an open window area above and between said panels;
(e) said door beam being connected to said lower portions of said downwardly extending leg sections between said inner and outer panels and outwardly of the window area; and
(f) means for attaching said outer and inner panels to the legs of said door frame with said door beam between said inner and outer panels including hinge members positioned outside said panels for cooperating with one of said legs positioned inside said panel member and a latching member positioned outside said panels for cooperating with the other of said legs positioned inside said panels whereby portions of said panels are sandwiched between said frame and said hinge members and said latching member.

4,328,643

GATE ASSEMBLY

Edward J. Bell, "Springbok", Injune, Queensland, 4454, Australia

Filed Jul. 24, 1980, Ser. No. 172,078
Claims priority, application Australia, Jul. 26, 1979, PD9733
Int. Cl.[3] E05D *15/28*; A01K *29/00*
U.S. Cl. 49—381 10 Claims



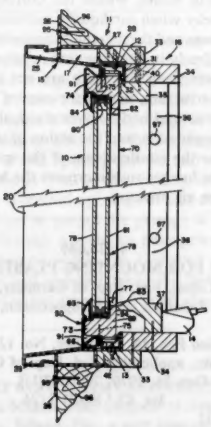
1. A gate assembly for closing an opening defined by the parallel walls of a crush or race including a closure part adapted to be pivoted to move from a closed position at which said closure part extends across said opening, to an open position to one side of said opening, said closure part being supported by support means pivotable about a substantially vertical axis located on or adjacent one wall of said crush or race and spaced from said opening and said support means being connected to one side of said closure part exteriorally of said crush or race.

4,328,644

PLASTIC CLAD WINDOW AND METHOD OF MANUFACTURE

Roger P. Scott, and W. Wayne Kahle, both of McConnelsville, Ohio, assignors to Philips Industries, Inc., Dayton, Ohio

Filed Dec. 10, 1979, Ser. No. 101,925
Int. Cl.[3] E06B *3/00*
U.S. Cl. 49—501 12 Claims



1. A composite window frame subassembly for supporting a sash in a building opening comprising

(a) a prefabricated unitary rectangular annular synthetic plastic shell having substantially the same cross section on all sides and including substantially parallel rearwardly extending flange portions defining a continuous rearwardly open channel,

(b) said plastic shell comprising top, bottom and side portions having miter joints welded together at all corners thereof to form an integral four-sided unit independently of the remainder of said assembly,

(c) a wooden frame complementary in shape and dimensions to said shell and including a forward portion received with said channel in secured relation with said shell and a rearward portion extending beyond said shell, whereby when said subassembly is installed in a wall, the outer side thereof is clad with protective plastic while the inner side presents substantially only wooden surfaces for finishing,

(d) said frame forward portion being proportioned to be received within said shell channel by direct relative movement of said frame and shell toward each other,

(e) said plastic shell including wall and web portions defining a structure of closed hollow cross section including a nose portion proportioned to project forwardly of a wall wherein said frame is mounted and flange portions projecting in spaced parallel relation from said hollow section to define said channel,

(f) said wooden frame including jamb elements secured together at the corners of said subassembly including a forward edge portion received within said channel, and

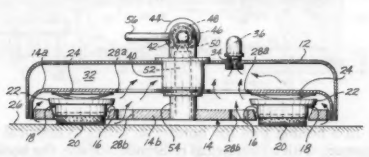
(g) the peripherally inner of said flange portions including a further flange portion extending at right angles thereto and having an integral flexible lip portion extending therefrom in inwardly overlying relation with said inner flange portion in position for sealing engagement by the associated sash.

4,328,645

MULTIPLE SPINDLE FLEXIBLE SANDING HEAD

Joseph J. Sauer, Arlington, Tex., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 4, 1980, Ser. No. 156,282
Int. Cl.[3] B24B *23/02*
U.S. Cl. 51—170 T 5 Claims



1. An abrading apparatus for removing material from a surface comprising: a housing open ended on one side, a bearing centrally located in the closed side of the housing and extending toward the open side, a drive shaft mounted in the bearing, an inner support member and an outer support member fastened to the drive shaft with the outer support member having a multiplicity of spaced apart openings shaped like an outward extending frustrum of a cone, a free floating cylindrical shaped head located in each opening with an abrasive disc on the outer end and an enlarged diameter on the inner end, means for continuously urging each cylindrical shaped head outward to permit individual alignment of each head when contacting a contoured surface to be abraded, means for actuating the drive shaft to rotate the support members with heads, and means for removal of debris generated by the abrasive heads.

4,328,646

METHOD FOR PREPARING AN ABRASIVE COATING

Grzegorz Kaganowicz, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

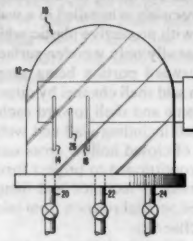
Filed Nov. 27, 1978, Ser. No. 963,819
Int. Cl.[3] B24B *1/00*
U.S. Cl. 51—281 R 4 Claims

1. In a method for lapping an article of submicron dimensions comprising the steps of:

glow discharging a mixture of silicon- and oxygen-containing precursors of SiO_x;

depositing the product onto a substrate;

establishing relative motion between said substrate and article to be lapped; and



contacting said article with said deposited product; the improvement which comprises using as the precursors SiH_4 and a gaseous compound selected from the group consisting of N_2O, CO_2 and H_2O.

4,328,647

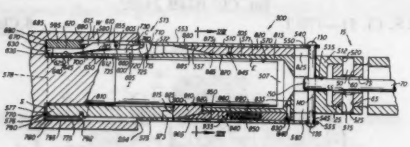
INSIDE, OUTSIDE HONING TOOL

Robert H. Gillette; Terrence N. Brammall; Kent Shelton, and Chris Cramer, all of Angola, Ind., assignors to Brammall, Inc., Angola, Ind.

Filed Apr. 9, 1980, Ser. No. 138,700

Int. Cl.³ B24B *33/02*

U.S. Cl. 51—338 **3 Claims**



1. In a honing tool for honing an offset cylindrical surface concentric with a cylindrical reference surface, the honing tool having a hollow elongated tool body with a plurality of stone supporting tool holders circumferentially arranged around an external surface of the tool body, an improvement comprising:

means for pivotally mounting the tool holders to the external surface of the tool body;

means for expansion located external to said tool body; said means for expansion cooperating with said means for pivotally mounting to move the tool holders outwardly toward the cylindrical surface to be honed, in response to axial movement of said means for expansion in a selected direction, along the tool body;

means for guiding, said means for guiding being located on an interior cylindrical surface of said elongated tool body, and adapted for radial movement with respect to said interior cylindrical surface;

said means for guiding being operative to continuously center said elongated tool body about the cylindrical reference surface with respect to which the surface being honed is to be concentric.

4,328,648

SUPPORT SYSTEM

Alexandrs K. Kalpins, 144-39 37th Ave., Flushing, N.Y. 11354

Filed Mar. 21, 1980, Ser. No. 132,419

Int. Cl.³ E02D *27/34*

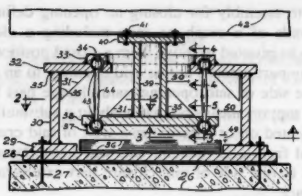
U.S. Cl. 52—167 **2 Claims**

1. A support system for protecting a supported structural body from dynamic forces as reversing horizontal earthquake motion, exterior explosions, cyclons, said system including a supporting foundation having an upper surface and at least three hanger devices secured between the lower surface of the supported structural body and the upper surface of the supporting structural body, each hanger device comprising:

a. A base including a bottom plate on a relatively short tubular element, said bottom plate being secured to the upper surface of the supporting foundation, and a top plate having a central opening, a plurality of enlarged openings and a spherical seat adjacent to each enlarged opening,

b. A plurality of hanger-rods, one for each enlarged opening, each hanger-rod having a rod portion and an upper and lower ball bearing, each upper ball bearing being free to rotate in a spherical seat and the attached rod portion extending downward through the adjacent enlarged opening; and

c. A relatively short pedestal element, said element including an upper plate secured to the lower surface of the supported structural body, a tubular support portion extending downward from the plate through the central opening of the top plate and lower plate secured to the lower most portion of the tubular support portion, said lower plate having a plurality of enlarged openings and a spherical seat adjacent to each enlarged opening, the lower end of each hanger-rod extending downward through an enlarged opening and the lower ball of each hanger rod being free to rotate, within the corresponding spherical seat, whereby when earthquake motion occurs the plurality of the base and the attached supporting structural body can move freely in any direction relative to the earth, and shock waves from the earth are not transmitted to the supported structure, and in the case of dynamic air pressure the structural body moves elastically horizontally by sloping hanger-rods, and the action of sloped hanger-rods is similar to the elastic action of the springs, increasing a slope of the hanger-rods increases the horizontal counterforce to the air pressure.



4,328,649

DEVICE FOR MOUNTING PLASTIC SHEETS

Gregor Sieve, Lohne, Fed. Rep. of Germany, assignor to Gebr. Pöppelmann, Inhabber Josef Pöppelmann, Lohne, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,496

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1979, 2935059; Oct. 26, 1979, 7930367[U]

Int. Cl.³ E06B *3/26*

U.S. Cl. 52—202 **19 Claims**

1. A device for mounting sheets on glass walls or roofs of greenhouses or other buildings comprising:

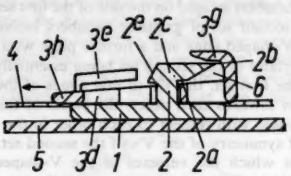
(a) a holder adapted to be mounted on a pane or its supporting frame;

(b) said holder comprising a mounting flange and a projection having a head spaced from said flange and adapted to pierce the sheet, and

(c) a clamping member arranged for sliding movement transversely of said projection between said projection head and said flange;

(d) said projection head including at least one face facing the flange;

(e) said clamping member being formed as a slide having at least one shoulder;



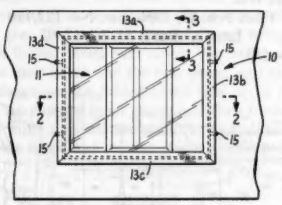
(f) said face or said shoulder being inclined so that sliding movement of said clamping member causes the pierced sheet to be pressed against said flange.

4,328,650

VENTILATED SOUND BARRIER FOR WINDOW OPENINGS

Maurice A. Garbell, P.O. Box 948, San Francisco, Calif. 94104

Filed Apr. 4, 1980, Ser. No. 137,514
Int. Cl.³ E04B 1/82; E04F 17/04
U.S. Cl. 52—202 **2 Claims**



1. A ventilated sound barrier for passing air through an opening of a building while impeding the passage of sound waves, said barrier comprising a substantially planar panel circumscribed by a frame formed of channel members having side walls which define U-shaped openings to one side of said panel; a barrier member affixed to the building and extending circumferentially of said opening therein; and means mounting said panel and frame in front of the opening, said barrier being projected into the U-shaped openings of said channel members but spaced therefrom to permit the passage of air around said barrier member through a tortuous passageway, said barrier member being received within the U-shaped openings a distance at least one and one-half times the distance from said barrier member to either side wall of said channel members.

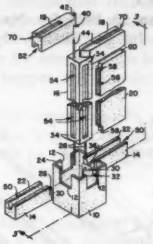
4,328,651

PRECAST CONCRETE CONSTRUCTIONS

Manuel Gutierrez, Miami, Fla., assignor to American Beverage Machinery, Inc., Miami, Fla., a part interest

Filed Jan. 14, 1980, Ser. No. 111,958
Int. Cl.³ E02D 27/00
U.S. Cl. 52—293 **18 Claims**

1. A precast concrete construction comprising a pair of grade beams, each beam having a groove adapted for receiving a wall panel, a footing box having notches, each notch adapted to receive an end of a grade beam, a column supported on said ends, each beam having an aperture at its end to receive a reinforcing rod extending from the column and into the footing box to enable unifying the beams and the column when grout is poured into the footing box, and a roof beam supported on the top of the column, the roof beam having an aperture for



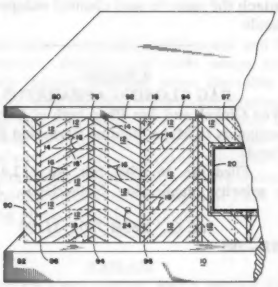
receiving a reinforcing rod extending from the top of the column to enable unifying the column and the roof beam.

4,328,652

INSULATED STRUCTURE AND METHOD FOR INSULATING A STRUCTURE

Nicholas P. Naumovich, Jr., Dallas, Tex., assignor to Parsec, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 4,820, Jan. 19, 1979, abandoned. This application Apr. 10, 1980, Ser. No. 139,149
Int. Cl.³ E04B 5/00, 1/64
U.S. Cl. 52—408 **20 Claims**



12. In a structure comprising a base, a plurality of spaced, vertical, exterior wall supporting studs mounted on said base, abutting panels of exterior grade material attached to and covering the outside of said vertical studs to form an outside wall and abutting panels of interior grade material attached to and covering the inside of said vertical studs thereby forming an inside wall with a wall space between said inside and outside walls formed by said interior and exterior grade panels, insulation for such structure comprising:

(a) a sheet of self-adhering pliable insulating material placed over and attached in an airtight manner to a predetermined area of said exterior grade panels, and

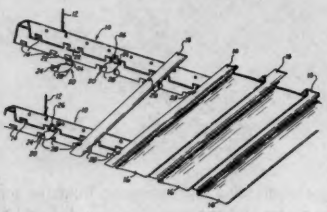
(b) successive sheets of said pliable insulating material placed over and attached in an airtight manner to the remaining area of said exterior grade panels in overlapping relationship with each other and with said first sheet to form a continuous, airtight, insulating seal over said exterior grade material,

(c) said pliable insulating material comprising a pliable plastic and a pressure-sensitive adhesive on at least one surface of said pliable plastic.

4,328,653
CEILING PANEL CLIP

Joseph A. Anderle, Clifton, N.J., assignor to Levolor Lorentzen, Inc., Lyndhurst, N.J.

Filed Jan. 23, 1980, Ser. No. 114,588
Int. Cl.[3] E04B 5/55
U.S. Cl. 52—460 1 Claim

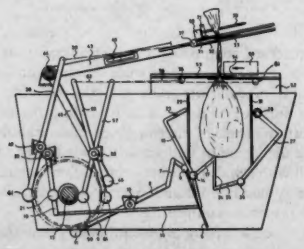


1. In a suspended ceiling: at least two substantially parallelly arranged U-shaped channels with legs flaring slightly downwardly with respect to each other and with spaced inverted L-shaped grooves facing each other so as to leave therebetween an essentially T-shaped portion, two ceiling panels received in said L-shaped grooves so as to be suspended from said channels, at least two clips, each clip comprising an essentially flat sheet metal body from which extend at substantially right angles two spaced leg portions engaging a respective one of said T-shaped portions of the respective channel, and from which body extend, at essentially right angles in a direction opposite to that of said leg portions and at an angle of 90° with respect to the latter, two spaced prongs, and at least one essentially flat strip of flexible sheet metal extending between said ceiling panels, said prongs being bent around said strip to thereby attach the same to said channel independently of said ceiling panels.

4,328,654
BAG CLOSING APPARATUS

Mannes Van Ginkel, and Jan Plug, both of Barneveld, Netherlands, assignors to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed Jan. 16, 1980, Ser. No. 112,476
Claims priority, application Netherlands, Jan. 29, 1979, 7900674
Int. Cl.[3] B65B 7/06, 51/00
U.S. Cl. 53—285 7 Claims

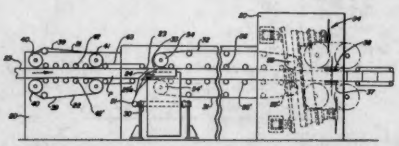


1. A bag closing apparatus provided with a first set of gripping members for handling the open end of a bag, said first set of gripping members comprising two essentially parallel plates having essentially aligned V-shaped edges and arranged in mutually spaced relationship, a third plate having a V-shaped edge and movable parallel to the movement of the first mentioned plates in the space between the said first mentioned plates, the V's of the said V-shaped edges of the first mentioned two plates on the one hand and the V of the V-shaped edges of the third plate on the other hand being open towards each other, the direction of movement of all of said plates coinciding with the axis of symmetry of said V's, the said movement being from a first position in which the vertexes of the V-shaped edges are spaced apart sufficiently to permit the open end of a bag to pass therethrough to a second position in which the vertexes of the V's are very near to each other, a second set of gripping members located on the side of the first set toward the bag, said second set of gripping members including a plate having a V-shaped edge and a further plate with a V-shaped edge, the plates of the second set being essentially parallel to those of the first set, the V's of said edges of the second set being open towards each other, the plates of the second set being movable with respect to each other in the direction of the axis of symmetry of the V's of the second set from a first position in which the vertexes of the V-shaped edges are spaced apart a sufficient amount to permit the top of the bag to pass therebetween, to a second position in which the Vertexes of the V's are nearer to each other than in the first position, and means for moving said first set of gripping members with respect to the second set of gripping members in a direction generally perpendicular to the plane of said plates, and a bag closing means operable at a location between the first and second sets of plates after the sets have been moved apart.

4,328,655
METHOD OF MANUFACTURING A PACKAGED WEB PRODUCT AND APPARATUS THEREFOR

Harvey J. Spencer, and William P. Niedermeyer, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed Feb. 19, 1980, Ser. No. 122,730
Int. Cl.[3] B65B 11/10, 63/02
U.S. Cl. 53—439 27 Claims



1. A method of manufacturing a packaged web product such as facial tissue, toweling and the like comprising:

advancing at uniform speed a plurality of superposed webs of indefinite length along a lineal path,

compressing said superposed webs in a direction to the superposition thereof and to an extent of reducing the superposed height to below about 75% of the uncompressed height,

passing said compressed webs through an open-ended forming device and simultaneously enveloping said superposed compressed webs within said forming device in an indefinite length with over lap folded wrapping material,

sealing said over lap folded web means in the over lapped portion while maintaining said superposed webs under compression, and

transversely severing the enveloped, compressed web at equally longitudinally spaced apart transverse lines in said path and while said webs are being advanced.

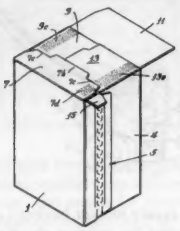
4,328,656
FOLDING ICE-CREAM CARTON, CARTON BLANK, AND METHOD

Thomas W. Froom, Pittsford, N.Y., assignor to Rendoll Paper Corporation, Rochester, N.Y.

Division of Ser. No. 842,747, Oct. 17, 1977, Pat. No. 4,239,115. This application Jun. 10, 1980, Ser. No. 158,167
Int. Cl.[3] B65B 43/08, 43/26
U.S. Cl. 53—458 15 Claims

1. A method of packaging a fluid semi-solid mass which

comprises filling a closed-end tube formed of front, rear, cover, and bottom panels fastened together into a tube by means of a front cover flap fastened to the front panel and having at the open end respectively connected to said panels and said front cover flap by fold lines, front and rear panel inner end wall-forming flaps, one of which is adapted to overlie the other when they are folded in; a side cover flap having a tuck-in tab projecting from the mid-portion thereof, which side cover flap is adapted, when it is folded in, to overlie the overlying inner end wall-forming flap; a bottom panel flap adapted, when folded in, to overlie the tuck-in tab of the side cover flap; and, a glue-flap extension of the front cover flap adapted, when



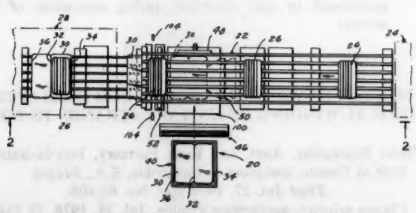
folded in, to overlie the folded-in side cover flap; folding in one of the inner end wall-forming flaps; folding in the other end wall-forming flap so that it overlies the one already folded in, folding in the side cover flap thereover; applying strips of glue along and adjacent the fold lines between the folded-in inner end wall-forming flaps and the panels to which they are connected, the glue strip adjacent the rear panel being terminated short of the folded-down side cover flap and being disposed between the tuck-in tab and the rear panel, and the other glue strip extending over the folded-down side cover flap between the tuck-in tab and the front panel; and then folding the outer end wall-forming flap and the glue-flap extension into contact with said glue strips and causing them to adhere thereto.

4,328,657

AUTOMATIC CARD DISPENSER AND PICK-OFF ASSEMBLY

C. Edward Brandmaier, Centerport, and Edmund G. Dennis, Belle Terre, both of N.Y., assignors to Cashin Systems Corp., Hauppauge, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,529
Int. Cl.³ B65B *49/16, 25/06*
U.S. Cl. 53—586 **12 Claims**



1. A cardboard sheet dispenser for use on a food product slicing machine line that groups the slices into segregated batches of predetermined measure, the dispenser being operable to dispense a sheet of cardboard from a storage area to a first location at which a batch of the slices are placed thereon, the cardboard sheet dispenser comprising:

a hopper for containing a plurality of vertically stacked cardboard sheets, the hopper including a base and a plurality of strippers at the base for cooperating in supporting the stack and cooperating in separating the cardboard sheets at the base to assure against sticking of the cardboard sheets to one another while permitting only one cardboard sheet at a time to be removed from the base of the hopper, the hopper including a top and being provided with restrainers intermediate the top and the base for cooperating in supporting the stack and to fan the cardboard sheets to prevent sticking of one to the other;

a pick-off assembly for removing the lowermost cardboard sheet from the hopper and transferring it to a second location; and

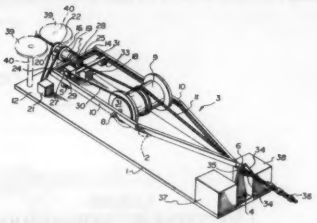
conveying means for conveying the sheet at the second location to the first location at a predetermined time to permit the batch to be placed thereon.

4,328,658

WEED HARVESTER

J. Armand Desrosiers, 8744-89 Ave., Edmonton, Alberta, Canada (T6C 1N7), and Ralph B. Arner, R.R. 2 Sherwood Park, Alberta, Canada (T8A 3K2)

Filed Sep. 23, 1980, Ser. No. 189,584
Claims priority, application Canada, Apr. 15, 1980, 349883
Int. Cl.³ A01D *44/00*
U.S. Cl. 56—8 **11 Claims**



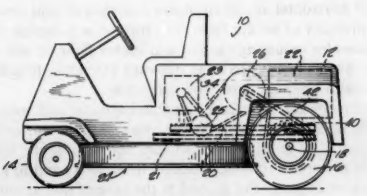
1. A plant harvester comprising cable means; and first drive means for positively rotating said cable means around the longitudinal axis thereof, whereby when the cable means is rotated in contact with plants, the plants are wrapped around the cable means and thus pulled from the ground, said cable means comprising an uninterrupted predetermined length of cable devoid of swivel or other relatively rotatable couplings such that the rotational drive of said first drive means is transmitted along the full predetermined length of cable for wrapping and pulling plants from the ground.

4,328,659

RIDING MOWER INCLUDING BELT DRIVE SYSTEM

Carl E. Seyerle, Abingdon, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 9, 1980, Ser. No. 157,470
Int. Cl.³ A01D *69/08*
U.S. Cl. 56—11.8 **14 Claims**



1. A riding lawn mower comprising a frame carrying a cutter blade, an axle mounted on said frame and carrying ground-engaging wheels supporting said frame for travel over the ground, a prime mover supported on said frame, a drive pulley, means drivingly connecting said drive pulley with said

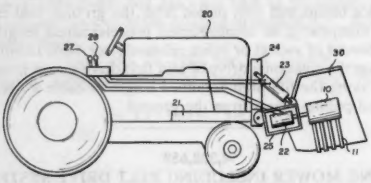
prime mover for selective rotation of said drive pulley in forward drive and reverse drive directions, a driven pulley, an endless belt trained about said drive and driven pulleys for rotating said driven pulley in response to rotation of said drive pulley, said belt having a first side which is under dynamic and static tension and a second side which is under static tension when said drive pulley is rotated in one direction, said second side being under static and dynamic tension and said first side being under static tension when said drive pulley is rotated in the opposite direction, a drive wheel, means mounting said driven pulley and said drive wheel for common rotation about a first axis and for movement of said first axis relative to said drive pulley, a driven wheel mounted on one of said axle and said ground-engaging wheel for rotating said ground-engaging wheel in response to rotation of said driven wheel, an endless, flexible drive member, and means for training said flexible drive member about said drive and driven wheels for rotating said driven wheel in response to rotation of said drive pulley so that the resultant force applied on said drive wheel by said flexible drive member, when said drive pulley is rotated in either direction, is in a direction tending to move said drive pulley relative to the drive pulley in a tensioning direction to increase the static tension on said first and second sides of said belt.

4,328,660

GRAPEVINE SUCKERING TOOL

Neil J. Simmons, R.D. #5, Culver Rd., Penn Yan, N.Y. 14527

Filed Oct. 2, 1980, Ser. No. 193,076
Int. Cl.[3] A01D *50/00*
U.S. Cl. 56—12.7 **12 Claims**



1. A grapevine suckering tool comprising:

a. a rotor;

b. means for moving said rotor alongside grapevines in a row;

c. the axis of said rotor being arranged within acute vertical and horizontal angles from the direction of said row;

d. a plurality of sucker flails each formed as a flexible strap;

e. means for mounting each of said sucker flails on said rotor so that said straps have an outward extending length and a width oriented axially of said rotor;

f. said rotor and said flails being arranged so said rotor can spin as said rotor passes by the base of a grapevine to make said flails slap downward toward and against the base of said grapevine to attack suckers from above and to knock suckers down to the ground at the base of said grapevine; and

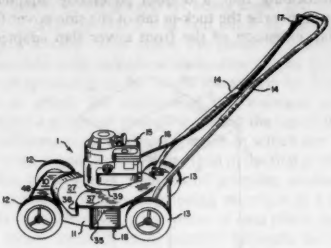
g. said downward slapping flails being arranged to drag over the ground at the base of said grapevine in a high friction scrubbing motion for damaging and breaking away from said grapevine suckers that said flails have knocked to the ground at the base of said grapevine.

4,328,661

CROSS FLOW ROTARY MOWER HAVING AN AXIAL EXPANSION SECTION

Hugo S. Ferguson, Averill Park, N.Y., assignor to Duffers Associates, Inc., Poestenkill, N.Y.

Filed Sep. 12, 1980, Ser. No. 186,445
Int. Cl.[3] A01D *35/26*
U.S. Cl. 56—13.4 **8 Claims**



1. A cross flow rotary mower having:

(a) a rotor mounted for rotation about a generally vertical axis, said rotor having generally horizontal outer cutting edges and upwardly extending blower vanes spaced outwardly from the rotor axis;

(b) driving means for rotating the rotor;

(c) a housing surrounding the rotor having an upper wall, a bottom plate and side walls for forming a conduit cooperating with said rotor to form a cross flow blower having an inlet region and an outlet region angularly spaced downstream in the direction of air flow through said blower from said inlet region;

(d) said conduit including means cooperating with said rotor when said rotor is rotated to produce vortex air flow on one side of the rotor axis near an area where said blower vanes pass from said outlet region to said inlet region;

(e) said bottom plate extending under a substantial portion of the area of rotation of said rotor including substantially a semi-circle of travel of said cutting edges rearward of said inlet region;

(f) said cutting edges extending beyond said bottom plate in a major portion of a forward semi-circle of travel of the cutting edges; and,

(g) said upper wall having an axially expanded section at said area where said blower vanes pass from said outlet region to said inlet region to form an axially expanded vortex chamber whereby said vortex air flow is stabilized and positioned in said chamber during operation of said mower.

4,328,662

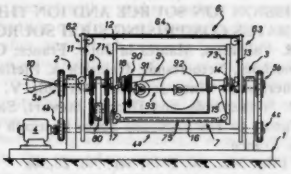
MULTIPLY TWISTING MACHINE FOR HIGH SPEED HELICAL WINDING OF UNITARY STRANDS TO FORM A CABLE

Pierre Bretegnier, Anet, and Rene Fortassy, Ivry-la-Bataille, both of France, assignors to Eurocable, S.A., France

Filed Jul. 27, 1979, Ser. No. 61,405
Claims priority, application France, Jul. 28, 1978, 78 22436
Int. Cl.[3] D01H *7/86;* D07B *3/12*
U.S. Cl. 57—58.61 **8 Claims**

1. A multiple twisting machine adapted to helically twist a plurality of unitary strands which are fed from feed bobbins along a predetermined path and to deliver a twisted cable to a windup bobbin, said machine comprising said bobbin and means for feeding said cable to said windup bobbin, at least two nested coaxial frames, said frames including a first central frame and a second external frame, a motor and means for reversing rotation, rotatably driving said frames in opposite directions and at substantially the same speed, each of said frames comprising at least two bearings and defining between

said at least two bearings an eccentric portion of said cable path comprising a surface of revolution which encloses an internal space and which extends from a first end of said space to a second end outside of said space, said path passing axially within each of said at least two bearings whereby said cable receives two twists in the same direction when it passes through said at least two bearings of each of said frames, a shaft held within said first frame, a cradle rotatably mounted on said shaft, said cradle being held immobile and defining an end of



said cable path, said path further comprising portions of each of said frames which extend between adjacent bearings on each of said frames, a cage, said means for reversing rotation comprising two rotatably and reciprocally driven pinions within said cage, said cage being pivotably and eccentrically mounted on an axis and generally having a stable position due to its weight, each of said pinions being coupled to one of said frames by a belt moving about two pulleys which are integral with said pinions.

4,328,663

TWO-FOR-ONE SPINNING OR TWISTING SPINDLE HAVING A COMPRESSED-AIR-OPERATED THREADING ARRANGEMENT

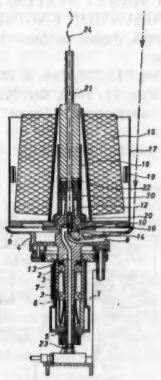
Jürgen Kallmann, Kaarst, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Aug. 11, 1980, Ser. No. 176,702

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939702

Int. Cl.³ D01H *7/86, 15/00*

U.S. Cl. 57—279 **4 Claims**



1. A two-for-one twisting spindle comprising; a spindle rotor having a hollow shaft, said shaft having a thread exit opening, a stationary supply package carrier having a supply package of thread mounted on said rotor, a thread storage member positioned beneath said supply package carrier, a thread exit line extending substantially radially from said storage member, an injector nozzle connected within said hollow shaft and forming an annular gap therebetween, compressed air operated threading means to supply compressed air to said thread exit line and said hollow shaft through said injector nozzle to cause a thread to be drawn by suction through said thread exit passage and said hollow shaft which thread is supplied from said thread storage member, said injector nozzle forming a continuation of said thread exit line and directed towards said thread exit opening, said compressed air operated threading means creating a suction through said thread exit line and said hollow shaft through said injector nozzle and said spindle hollow shaft to be drawn in a predetermined direction opposite to the direction of thread travel during the twisting process whereby a moving thread drawn by suction may be connected to a thread from said supply package during normal operation of said spindle.

4,328,664

APPARATUS FOR THE SZ-TWISTING OF STRANDING ELEMENTS OF ELECTRIC OR OPTICAL CABLES AND LINES

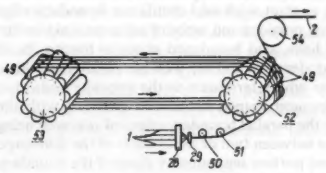
Dieter Vogelsberg, Coburg, and Klaus Koch, Berlin, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 59,213, Jul. 20, 1979, abandoned. This application Jan. 27, 1981, Ser. No. 228,736

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833201

Int. Cl.³ H01B *13/04*

U.S. Cl. 57—293 **17 Claims**



1. In the apparatus for the SZ-twisting of material comprising at least one element of an electrical or optical cable or line, including at least one stationary supply device for the material, a twisting device, a pull-off and wind-up device, and a twisting section which comprises a first and a second twisting point and at least one twisting head arranged between the two twisting points, which grips and twists the at least one element, the improvement comprising:

(a) the twisting head comprising at least one cylindrical deflection means which is stationary in the circumferential direction of the material to be twisted and with which the material to be twisted is in contact at least over part of the circumference, and the axis of which is set at an angle to the axis of the tautly conducted materials to be twisted and encloses with the latter an acute angle; and

(b) means for changing the relative spatial relationship between the deflection means and material to be twisted at intervals.

4,328,665

LINK FOR STEEL SPROCKET CHAINS

Klaus Taubert, Kirchen; Herbert Wehler, Neunkirchen-Salchendorf, and Alfred Bald, Siegen, all of Fed. Rep. of Germany, assignors to Amsted-Siemag Kette GmbH, Betzdorf, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 26,217

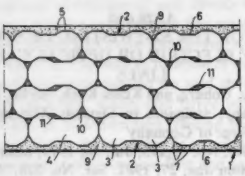
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814587

Int. Cl.³ B21L *17/00;* **B23P** *17/02;* **F16G** *13/07*

U.S. Cl. 59—88 **2 Claims**

1. A link punched out of a sheet metal strip for use in steel sprocket chains comprising a pair of spaced broadened por-

tions each containing an eye for chain pins and chain sleeves and a web extending between and interconnecting said broadened portions, said link having an axis extending between and passing through the centers of said eyes wherein the improvement comprises that said link is symmetrical on both sides of the axis extending between and through centers of said eyes, said broadened portions and web consist of rectilinear boundary edges whereby a number of rows of links can be punched from a common plane of a sheet metal strip so that boundary edges of adjacent links can be cut simultaneously with the adjacent broadened portions of said links in the same row disposed in abutting contacting relation along one of said rectilinear boundary edges of each and with the adjacent rows of links disposed in abutting side-by-side relation and the axes



thereof disposed in parallel relation and with the links in adjacent rows having said eyes therein disposed in offset relation in the axial direction thereof so that said rectilinear boundary edges of said broadened portions of one link are disposed in abutting contact with said rectilinear boundary edges of said broadened portions and webs of adjacent links in the adjacent rows of links, said broadened portions having the shape of a regular dodecagon and the web has parallel rectilinear boundary edges which terminate at the opposite ends at corners of the dodecagon shaped broadened portions with the spacing between the parallel boundary edges of said web being equal to the space between two of the corners of the dodecagon shaped broadened portion separated by three of the boundary edges of said broadened portion.

4,328,666

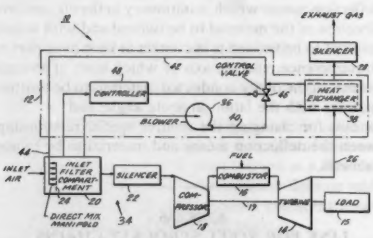
HEAT RECOVERY ANTI-ICING SYSTEM

James R. Cummins, Jr., Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,783

Int. Cl.³ F02C *7/047*

U.S. Cl. 60—39.09 D **13 Claims**



1. A heat recovery anti-icing system for use with a combustion turbine system of the type including a gas turbine, a combustor for supplying hot gases to said turbine, a turbine compressor supplying compressed air to said combustor, an air flow path including an inlet filter compartment for receiving ambient air which is supplied to said compressor and an exhaust stack expelling said hot gases after they pass through said turbine, said system comprising:

a heat exchanger located in said exhaust stack;

blower means for removing at least some of the air located in said air flow path upstream of said compressor and supplying said air to said heat exchanger, said heat exchanger adapted to transfer heat from said hot gases located in said exhaust stack to said removed air supplied by said blower means; and

conduit means for returning said removed air supplied by said blower means to said inlet filter compartment after said removed air has been heated in said heat exchanger.

4,328,667

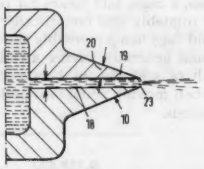
FIELD-EMISSION ION SOURCE AND ION THRUSTER APPARATUS COMPRISING SUCH SOURCES

Dominique R. Valentian, Mantes la Jolie, France; Cesare M. Bartoli, Voorhout, Netherlands; Heinrich A. Pfeffer, Noordwijk, Netherlands; Hans-Joachim Herhudt V. Rohden, Oegstgeest, Netherlands, and Duncan Stewart, Slough, England, assignors to The European Space Research Organisation, Paris, France

Filed Mar. 30, 1979, Ser. No. 25,348

Int. Cl.³ F03H *1/00*

U.S. Cl. 60—202 **12 Claims**



1. A field-emission ion source, comprising a housing containing a hollow space in communication with a passage suitable for supplying a metal or metal alloy to said hollow space, said housing having a slit in contact with said metal or metal alloy in said hollow space and operative to discharge said metal in the liquid phase from said hollow space, said discharge slit having a width of no more than 0.020 mm.

4,328,668

SECONDARY AIR SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

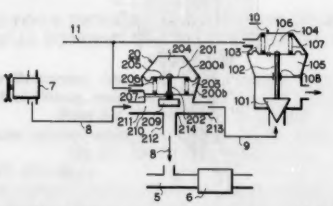
Motohisa Miura, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 913,737, Jun. 6, 1978, abandoned. This application Sep. 11, 1980, Ser. No. 185,724

Claims priority, application Japan, Jun. 28, 1977, 52/84919[U]

Int. Cl.³ F01N *3/22*

U.S. Cl. 60—290 **5 Claims**



1. A secondary air supply system for an internal combustion engine comprising:

an air pump driven by an engine for pumping pressurized air;

a secondary air supply line connecting said air pump with an exhaust pipe of said engine for supplying air to said exhaust pipe to oxidize unburnt exhaust gas components therein; and

control means in said secondary air supply line for controlling the amount of air released into said exhaust pipe and the atmosphere from said secondary air supply line, to thereby correctly control the oxidation of unburnt gases emitted by an engine,

said control means including:

first valve means for entirely closing the secondary air supply line to the exhaust pipe under deceleration conditions; and

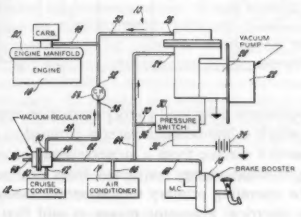
second valve means operatively connected to said first valve means for providing increased pressure for a predetermined period within said secondary air supply line under acceleration conditions of the engine and pressure release thereafter under high pressure conditions, said first and second valve means including first and second valve members, respectively, and first and second means for respectively operating said first and second valve members in response to intake manifold pressures, said second valve member having an undersurface acted on by air pressure within the secondary air supply line so that pressure therein can urge said second valve member in a direction opposite to that applied by said second operating means.

4,328,669

VACUUM POWER SYSTEM AND REGULATOR THEREFOR

Dewey F. Mort, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 15, 1980, Ser. No. 121,671
Int. Cl.³ F16D *31/02*
U.S. Cl. 60—397 **3 Claims**



1. A vacuum power system having first and second devices operable by vacuum power and first and second sources of vacuum power, said first source when operating normally providing sufficient vacuum power to operate said first device and said second source providing sufficient vacuum power to operate said second device, said second source being variably operable to maintain the vacuum operating level required by said second device;

means sensing the lack of sufficient vacuum power from said first source to operate said first device when such lack occurs, said means then acting to communicate sufficient vacuum power from said second source to said first device to operate said first device;

and means responsive to changes in vacuum level provided from said second source as vacuum power therefrom is used to cause said second source to be operated variably as needed to maintain at least sufficient vacuum power to operate said first and second devices.

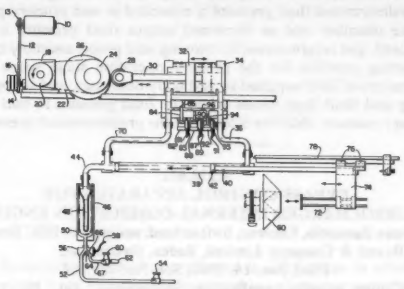
4,328,670

HYDRAULIC MOTION AMPLIFIER

John R. McLean, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sep. 29, 1980, Ser. No. 192,011
Int. Cl.³ F15B *7/02*
U.S. Cl. 60—543 **7 Claims**

1. A hydraulic motion amplification system comprising a first hydraulic cylinder having a piston and a piston rod, a second hydraulic cylinder having a piston and a piston rod, a motor driven cam and a cam follower contacting said cam, said cam follower being connected to said first piston rod for driving said first piston in a first direction, a first hydraulic line connecting the front end of said first hydraulic cylinder to the rear end of said second hydraulic cylinder, a second hydraulic line connecting the front end of said second hydraulic cylinder to the rear end of said first hydraulic cylinder, hydraulic fluid on both ends of both hydraulic cylinders, a flexible bladder hydraulically connected to said second hydraulic line, an air



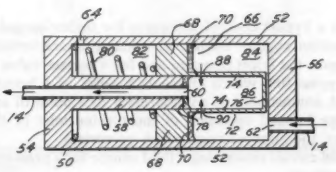
chamber surrounding said bladder and means for controlling air pressure within said air chamber for controlling hydraulic pressure between the front face of said second piston and the rear face of said first piston and for driving said first piston in a second direction, and a third hydraulic line connecting said first and said second hydraulic lines and an air cylinder for opening and closing said third hydraulic line for balancing hydraulic pressure on both ends of both hydraulic cylinders after each cycle of said system, said pistons having differing surface areas to produce a ratio of movement between said pistons.

4,328,671

FLUID PRESSURE INTENSIFIER

Jack E. Pattison, 115 S. Ridgeway Dr., Battle Creek, Mich. 49015

Filed May 12, 1980, Ser. No. 148,718
Int. Cl.³ B60T *13/58*
U.S. Cl. 60—563 **12 Claims**



1. A fluid pressure intensifier comprising a side wall and first and second end walls forming a body for receiving and transmitting pressurized fluid, a tube extending inwardly in said body from said first end wall, a piston assembly including a piston head slidable on said tube and a piston wall in spaced relation to said body side wall extending from said piston head toward said second end wall, said assembly being slidable in said body with an increase in pressure of fluid supplied to said body, said assembly dividing the interior of said body into a primary pressure chamber and a secondary pressure chamber, the cross sectional surface area of said primary pressure chamber being larger than the cross sectional surface area of said secondary pressure chamber, a portion of said piston assembly forming a moveable wall of said secondary pressure chamber to decrease the volume of said secondary pressure chamber as

the fluid pressure supplied to said intensifier increases, a fluid inlet means near said second end wall communicating with said primary pressure chamber for supplying fluid to said body, a fluid outlet means including a longitudinal opening through said tube and said first end wall communicating with said secondary pressure chamber for transmitting fluid from said body, fluid flow means in said piston wall for the passage of fluid freely between said primary and secondary pressure chambers during primary operation stages of said intensifier, shut off means for stopping the passage of fluid through said fluid flow means during secondary operation stages when a predetermined fluid pressure is exceeded in said primary pressure chamber and an increased output fluid pressure is required, and return means for moving said piston assembly to its starting position for the primary operation stage when the pressure of fluid supplied to said body decreases, and for opening said fluid flow means when the fluid pressure in said primary pressure chamber is less than the predetermined pressure.

4,328,672

BYPASS CONTROL APPARATUS FOR TURBOCHARGED INTERNAL-COMBUSTION ENGINES

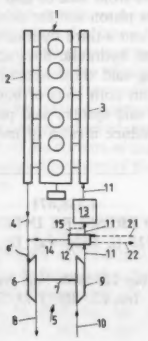
Bruno Zumstein, Lucerne, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 16, 1980, Ser. No. 159,608

Claims priority, application Switzerland, Jul. 11, 1979, 6463/79

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—606 **6 Claims**



1. In a bypass control apparatus for turbocharged internal-combustion engines having an opening characteristic dependent upon the boost pressure and for a bypass valve arranged in a bypass line which connects a point of a boost air pipe located downstream of a compressor to a point of an exhaust gas pipe located upstream of the turbine inlet of the turbocharger, the improvement which comprises:

a fluid circuit containing a fluid source for a pressurized fluid medium;

an actuating cylinder for actuating the bypass valve;

said actuating cylinder being loadable by the pressurized fluid medium;

said fluid circuit comprising a supply line;

a throttle valve having fixedly adjustable throttle cross-section arranged in said supply line between the fluid source and the actuating cylinder;

control throttle means arranged downstream of the actuating cylinder in the flow direction of the fluid medium;

resilient means for loading said control throttle means;

said control throttle means comprising two closure elements defining first and second closure elements;

a control air line branching off said boost air pipe;

piston means for actuating said two closure elements by boost air pressure; and

said resilient means in a rest condition maintaining the first closure element open and the second closure element closed.

4,328,673

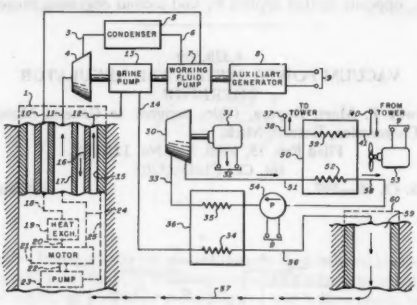
GEOTHERMAL PUMP DUAL CYCLE SYSTEM

Hugh B. Matthews, Boylston, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 25, 1980, Ser. No. 180,744

Int. Cl.³ F03G *7/00*

U.S. Cl. 60—641.4 **5 Claims**



1. Geothermal deep well energy extraction apparatus of the kind in which solute-bearing water is pumped to a first station at the earth's surface from a subterranean second station by utilizing thermal energy extracted from said solute-bearing water for operating primary turbine-motor means for driving primary electrical generator means at said first station, said solute-bearing water being returned from said first station into reinjection well means, said extraction means additionally including:

working fluid generator means at said second station utilizing said thermal energy for supplying a first working fluid for driving subterranean turbine-motor means for driving subterranean pump means for pumping said solute-bearing water from said second to said first station,

said working fluid generator means being heated by said solute-bearing water at said second station; and

secondary turbine-motor means driving secondary electrical generator means at said first station and responsive to the exhaust of said subterranean turbine-motor means of said subterranean pump means,

said secondary turbine-motor means additionally driving surface-located working fluid pump means for pumping the exhaust, after condensation, of said secndary turbine-motor means into said second station vapor generator means,

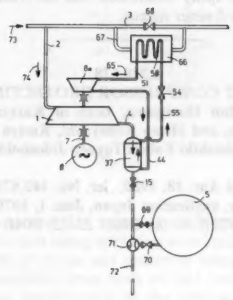
said secondary turbine-motor means additionally driving surface-located brine pump means operating in cooperative series connection between said subterranean pump means and reinjection well means,

said subterranean pump means, said surface located brine pump means, said secondary turbine-motor means, and said surface-located fluid pump means cooperatively substantially increasing the density of said rising exhaust from said subterranean turbine-motor means.

4,328,674
POWER STATION

Joachim Wenzel, Hauptmannsreute 46, 7 Stuttgart 1, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 934,760
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737915; Jul. 28, 1978, 2833136
Int. Cl.³ F01K 25/10
U.S. Cl. 60—648 3 Claims



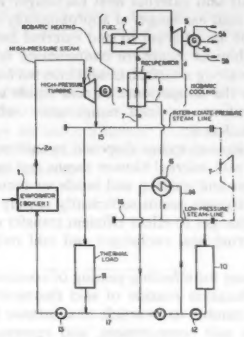
1. A power station comprising:
(i) a main pipe for conveying a gaseous medium under pressure
(ii) a branch pipe connected to said main pipe for receiving a flow of gaseous medium therefrom,
(iii) an expansion machine connected to said branch pipe to receive gaseous medium under pressure therefrom, said expansion machine being operable to convert pressure energy of said gaseous medium into usable energy
(iv) a heat pump including a compressor, an evaporator, and a heat exchanger, the compressor being coupled for operation to the expansion machine, and the heat exchanger being disposed in the branch pipe for heating of the gaseous medium therein, and
(v) a generator of electrical power connected for operation to the expansion machine.

4,328,675
METHOD OF RECOVERING POWER IN A COUNTERPRESSURE-STEAM SYSTEM

Anton Pocrnja; Alfred Bolkart, and Josef Dworschak, all of Munich, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 12, 1979, Ser. No. 84,195
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844742
Int. Cl.³ F01K 13/00
U.S. Cl. 60—676 3 Claims

1. A method of operating a counterpressure system in which steam is available in a first line at a relatively high pressure and in a second line at a relatively low pressure, said method comprising the steps of:
(a) substantially isobarically heating a quantity of steam at said relatively high pressure;
(b) expanding the substantially isobarically heated quantity of steam substantially to said relatively low pressure in a turbine and thereby performing mechanical work with the expanding steam;
(c) substantially isobarically cooling the expanded steam from step (b);
(d) feeding the said substantially isobarically cooled steam to said second line;
(e) preheating boiler feed water in indirect heat exchange with the expanded substantially isobarically cooled steam prior to feeding it to said second line; and
(f) boiling the feed water and producing steam at a pressure above that in said first line and expanding the steam generated in said boiler in a high pressure turbine before feeding the steam expanded in said high pressure turbine into said first line, the substantially isobaric heating of the steam

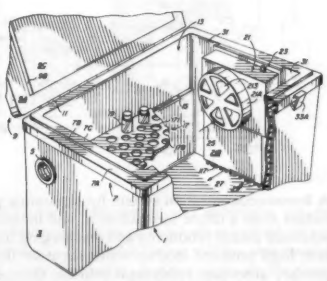


from said first line being effected in a first stage in which steam from said first line is passed in indirect recuperative line heat exchange with steam expanded in the turbine of step (b) and the steam is thereafter heated prior to its expansion in the turbine of step (b) in a combustion heater.

4,328,676
THERMOELECTRIC ENVIRONMENTAL CHAMBER

Michael A. Reed, Tucson, Ariz., assignor to Koolatron Industries, Ltd., Barrie, Canada

Filed Mar. 25, 1981, Ser. No. 247,623
Int. Cl.³ F25B 21/02; F25D 3/08
U.S. Cl. 62—3 13 Claims



1. A thermoelectric environmental chamber comprising in combination:
a. a compartment bounded by a plurality of thermally insulative walls, said compartment having a major opening for allowing access to said compartment;
b. cover means for covering said major opening to prevent inside air in said compartment from escaping from said compartment when said cover means is closed, said cover means being openable and closeable to cover or expose said major opening, said cover means being insulative to prevent passing of heat into or out of said compartment when said cover means is closed;
c. thermoelectric means for selectively causing flow of heat into or out of said compartment, said thermoelectric means including an internal heat exchanger disposed in said compartment on one of said walls, an external heat exchanger disposed outside of said compartment on said one of said walls, and solid state thermoelectric heat

pumping means disposed between said internal heat exchanger and said external heat exchanger for causing flow of said heat between said internal heat exchanger and said external heat exchanger;

d. external blower means for forcing outside air along a surface of said external heat exchanger to maintain said external heat exchanger at approximately the temperature of outside air adjacent to said external heat exchanger;

e. internal blower means for continuously recirculating said inside air along a surface of said internal heat exchanger to maintain the temperature of said inside air at a substantially uniform selected temperature when said cover means is closed;

f. internal shroud means disposed in said compartment for housing said internal blower means and said internal heat exchanger and guiding said inside air recirculated by said internal blower means sufficiently closely to said internal heat exchanger to effect efficient transfer of heat between said internal heat exchanger and said recirculated inside air; and,

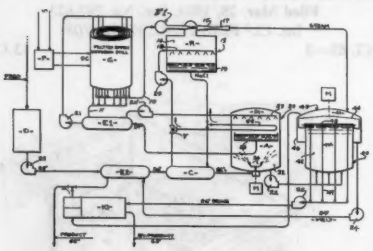
g. port means for effecting passing of communicating means from a location outside of said thermoelectric environmental chamber to an article or substance being thermally tested in said compartment, said communicating means effecting communication with the article or substance being thermally tested in said compartment from a location outside of said environmental chamber.

4,328,677

PELTIER FREEZE CONCENTRATION PROCESS

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343

Filed Sep. 23, 1980, Ser. No. 189,918
Int. Cl.³ B01D *9/04*
U.S. Cl. 62—124 **17 Claims**



1. A freeze concentration system for separating product and by-product from a dilute feed solution, and including;

a generator means producing and discharging high temperature high pressure motive water separate from a strong primary absorbent refrigerant solution thereof,

a means converting said motive water into high temperature steam,

a steam jet refrigeration means having a booster ejector operated with said steam and drawing a secondary refrigerant vapor from a chamber and having an exhaust, there being spray means discharging secondary absorbent refrigerant into said chamber for both evaporation and precipitation to a sump therein,

an absorber-freezer means having an absorber section with spray means discharging strong solution therein from the generator means for heat absorption and precipitation to a sump tray therein and returned as weak solution to said generator means by circulating means therefor, and having a freezer section with spray means for discharging dilute feed solution therein and to form an ice slurry thereof,

a first heat exchanger means transferring heat from the strong absorbent discharge of the generating means and into the weak absorbent return to said generator means,

a melter-washer means having a wash column section for the rise of said ice slurry to a floatation level and transferred thereto by a pump means from the absorber-freezer means and with a by-product discharge means, and having a melt section over and surrounding the floatation level to receive the booster-ejector steam exhaust, and with a product melt discharge means,

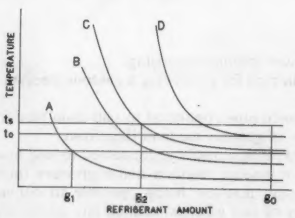
and a pre-cooler means transferring heat from a supply of the dilute feed solution and into the secondary refrigerant thereby chilling said dilute feed solution for discharge through said spray means and into the freezer section of the absorber-freezer means.

4,328,678

REFRIGERANT COMPRESSOR PROTECTING DEVICE

Hiroya Kono; Jun Hasegawa, both of Kariya; Mitsukane Inagaki, Anjyo, and Hisao Kobayashi, Kariya all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 18, 1980, Ser. No. 141,675
Claims priority, application Japan, Jun. 1, 1979, 54-69251
Int. Cl.³ F25B *49/00*; G05D *23/32*; F04B *49/10*
U.S. Cl. 62—126 **12 Claims**



1. A protecting device for protecting a refrigerant compressor which is connected to a refrigeration circuit containing a refrigerant enclosed therein from overheating problems resulting from a shortage of the refrigerant in the refrigeration circuit, said protecting device comprising;

a temperature sensor for sensing the temperature of an outer wall of said compressor in the vicinity of a refrigerant intake suction port and providing an output signal representative of the sensed temperature value;

a discriminator for detecting a shortage of the refrigerant by detecting a temperature value in the output from said temperature sensor which is greater than a set value, and emitting a refrigerant shortage signal when such a shortage is detected; and

protection means for taking action necessary to protect said compressor against such overheating problems resulting from such refrigerant shortage, in response to the signal emitted from said discriminator.

4,328,679

CAPABILITY CONTROL APPARATUS FOR COOLING SYSTEM HAVING DIRECT EXPANSION TYPE EVAPORATOR

Sampei Usui, and Tomihisa Ohuchi, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

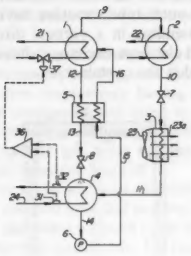
Filed Jan. 6, 1981, Ser. No. 223,003
Claims priority, application Japan, Jan. 16, 1980, 55-2619
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—141 **6 Claims**

1. In a capability control apparatus for a cooling system including a direct expansion type evaporator, a generator and an absorber, said apparatus comprising:

a first temperature sensor mounted at an inlet side of a cooling system for said absorber;

a second temperature sensor mounted at an outlet side of said cooling system for said absorber;

control means mounted in a heating system for said generator for regulating the amount of heat given to said generator; and



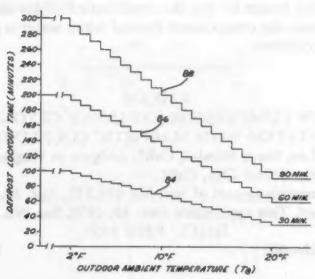
an arithmetic unit for actuating said control means, said arithmetic unit being operative to calculate the amount of heat to be given to said generator based on temperature signals supplied from both of said temperature sensors indicating temperatures at the inlet and outlet of said cooling system for said absorber, to thereby actuate said control means.

4,328,680

HEAT PUMP DEFROST CONTROL APPARATUS

Custis L. Stamp, Jr., Tyler, Tex., and Rollie R. Herzog, Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 14, 1980, Ser. No. 196,411
Int. Cl.³ F25D *21/06*
U.S. Cl. 62—155 **9 Claims**



1. In a heat pump having a reversible vapor compression refrigerant system including a refrigerant compressor, an indoor heat exchanger, an outdoor heat exchanger in thermal communication with outdoor atmosphere, and means for reversing refrigerant flow between said heat exchangers to switch the operation of the heat pump from an indoor heating mode to an outdoor heat exchanger defrost cycle mode, automatic defrost cycle control apparatus therefore comprising:

means for sensing the temperature of said outdoor atmosphere;

means for establishing a range of temperature related minimum defrost lockout time intervals during which operation of the defrost cycle is to be inhibited, said range of time intervals extending from a first interval effective at and above a first outdoor temperature to a second, longer interval effective at and below a second temperature level which is lower than said first temperature level;

means responsive to at least said temperature sensing means at least by the end of the defrost cycle to selecte one of said minimum time intervals to be effective as the next successive minimum defrost lockout time interval;

means for sensing the temperature of the refrigerant system at a predetermined point on the outdoor heat exchanger;

means responsive to said compressor and said refrigerant temperature sensing means and operative following the conclusion of a defrost cycle for clocking the time interval between defrost cycles only during the simultaneous occurrence of said compressor being in a running mode and the sensed refrigerant system temperature being below a predetermined temperature level;

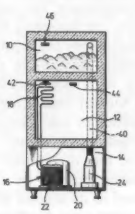
and means for initiating a defrost cycle when the clocked time interval is equal to said selected minimum defrost lockout time interval.

4,328,681

ELECTRIC REFRIGERATOR WITH AN AUTOMATIC ICE-MAKING UNIT

Shigetoshi Sakamoto, and Nobuya Suzuki, both of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Continuation of Ser. No. 951,727, Oct. 16, 1978, abandoned.
This application Jun. 30, 1980, Ser. No. 164,020
Claims priority, application Japan, Oct. 27, 1977, 52-128994
Int. Cl.³ G05D *23/32*; F25C *1/14*
U.S. Cl. 62—157 **4 Claims**

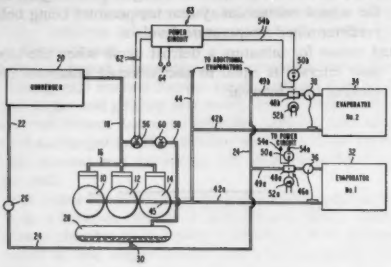


1. A combination refrigerator and automatic ice making apparatus comprising a housing in which is located (a) a refrigerator chamber, (b) an auger type ice making unit insulatingly spaced from said refrigerator chamber, (c) a bin for storage of ice only and insulatingly separated from both said auger type ice making unit and said refrigerator chamber, (d) conduit means for passage of ice from said auger type ice making unit to said bin and (e) a cooling system located in said housing comprising a compressor, a condensor and evaporators associated respectively with said refrigerator chamber and said auger type ice making unit, the evaporators for said refrigerator chamber and auger type ice-making unit being connected in parallel through respective changeover valves for refrigerant to the refrigeration system, one of the changeover valves being controlled by a temperature sensitive element for detecting the temperature in the refrigerating chamber, the other of the changeover valves being controlled by an ice detecting switch arranged in the ice-storage chamber, and the evaporator for said refrigerator chamber communicating with a delivery side of the compressor for the refrigerant through a hot gas by-pass line having a hot gas valve which is periodically energized for opening, while all of the changeover valves for the refrigerant are closed, by means of a cam timer.

4,328,682
HEAD PRESSURE CONTROL INCLUDING MEANS FOR SENSING CONDITION OF REFRIGERANT

John H. Vana, Allentown, N.J., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed May 19, 1980, Ser. No. 150,787
Int. Cl.³ F25B *41/00*; G01K *13/00*
U.S. Cl. 62—196 B **7 Claims**



1. In a refrigerating system essentially including at least one each of the following; namely, a compressor, a condenser, a surge receiver having top and bottom portions, and an evaporator, and in which there is a compressor gas discharge line that extends from the compressor to the condenser, a refrigerant supply line through which refrigerant, bypassing the receiver, flows directly from the condenser to the evaporator, a connecting line extending from the bottom of the receiver to the refrigerant supply line, a head pressure control line connected between the top portion of the receiver and the compressor discharge line, an expansion valve in the refrigerant supply line, and a refrigerant return line extending from the evaporator to the compressor, the improvement comprising:

(a) a sensing device for detecting flashing of the refrigerant in the refrigerant supply line upstream from the expansion valve, said sensing device, in the absence of flashing, normally being in a non-operating mode, said device switching to a second, operating mode upon but not before the occurrence of said flashing;

(b) normally closed valve means connected in the head pressure control line to control flow therethrough, said valve means being opened by the sensing device upon operation thereof to its second position, for dumping gas from the compressor gas discharge line into the top portion of the receiver through the head pressure control line to increase the head pressure in the refrigerant supply line means responsive to the detection of the flashing, said valve adapted to remain open only for that period of time necessary to elevate the head pressure in the refrigerant supply line means sufficiently to eliminate the flashing condition.

4,328,683
WATER HEATING SYSTEM

Robert B. Whitesides, Murrysville, and Ronald A. Holt, Export, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 12, 1981, Ser. No. 224,146
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 **8 Claims**

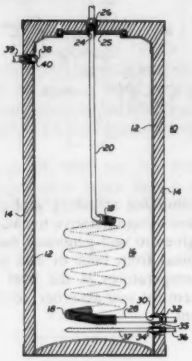
1. A container construction and combination including the following components and structure:

a container having a wall structure for confining water in the container,

an opening provided in an upper portion of the container and wall structure,

an opening provided in a lower portion of the container and wall structure,

a metal heat exchanger vertically disposed within the container, the heat exchanger being comprised of inner and outer tube structures joined together in heat exchange relationship by fins extending between and in intimate contact with the tube structures, said fins having cross sections sized to conduct the heat of a refrigerant in the inner tube structure to water adjacent the outer tube structure, the outer tube structure having outwardly directed fins extending in a vertical direction within the container, and the heat exchanger having an upper and lower end within the container,



means connecting the upper end of the heat exchanger in fluid communication with a source of heated refrigerant through the upper opening, the vertical disposition of the heat exchanger permitting the force of gravity to remove condensed refrigerant from the heat exchanger,

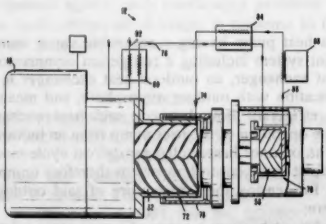
means connecting the lower end of the heat exchanger to the source of heated refrigerant through the lower opening, and

insulating means to free the combination of galvanic action between the components thereof when water is present in the container.

4,328,684
SCREW COMPRESSOR-EXPANDER CRYOGENIC SYSTEM WITH MAGNETIC COUPLING

Bruno S. Leo, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 894,677, Apr. 10, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 102,220
Int. Cl.³ F25D *9/00*
U.S. Cl. 62—402 **17 Claims**



1. A closed cycle refrigeration system comprising:

a screw compressor having a housing with a compressor chamber therein, said housing having inlet and outlet ends, an inlet and an outlet adjacent the ends of the said housing;

first and second helical rotors rotatably mounted within said housing, said first and second helical rotors respectively

having intermeshing lobes and recesses configured and fitted so that compression occurs in oil-free refringerant gas passing through said compressor;

an expander having an expander housing with an expander chamber therein, said expander housing having inlet and outlet ends, an inlet adjacent one end of said expander housing and an outlet on the outlet end of said expander housing;

first and second helical expander rotors rotatably mounted within said expander housing, said first and second helical expander rotors respectively having intermeshing lobes and recesses configured and fitted so that gas expansion takes place between said lobes and within said recesses in oil-free refrigerant gas upon rotation of said expander rotors in said expander housing;

means interconnecting said inlet and outlet on said compressor housing and said inlet and said outlet on said expander housing for providing a closed cycle for the circulation of oil-free refrigerant gas therein, for rejecting heat, and for receiving heat for producing refrigeration upon rotation of said rotors; and

a wall between said compressor housing and said expander housing, magnetic drive means connected to rotate with one of said compressor rotors and magnetic drive means connected to rotate with one of said expander rotors for magnetically coupling said rotors to transfer power therebetween as they rotate.

4,328,685

KNITTING MACHINES HAVING IMPROVED YARN SUPPLY ARRANGEMENTS

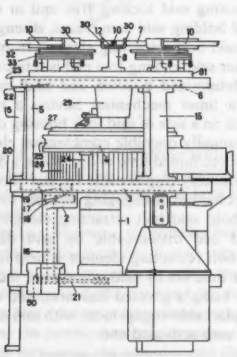
Arthur R. Smith, and Denis J. Harris, both of Leicester, England, assignors to Wildt Mellor Bromley Limited, Leicester, England

Filed May 29, 1979, Ser. No. 42,884

Claims priority, application United Kingdom, May 31, 1978, 26040/78

Int. Cl.³ D04B *15/42*

U.S. Cl. 66—125 R **6 Claims**



1. Circular knitting machine comprising upper and lower members having tricks cut therein for holding needles, a pair of cam systems rotatable around respective of said upper and lower members to slide needles in the tricks, upper and lower angular ring gears drivingly connected to the respective cam systems, a motor and drive shafts for rotating the upper and lower ring gears simultaneously, a creel for carrying yarn packages, means mounting the creel coaxially with the ring gears and permitting relative angular movement of the creel and the ring gears, at least one drive abutment for engaging the creel to rotate it conjointly with the ring gears and a shock absorber associated with the creel and the ring gears to thereby permit the creel to overrun the ring gears and move away from the drive abutment on stopping the motor and drive shafts.

4,328,686

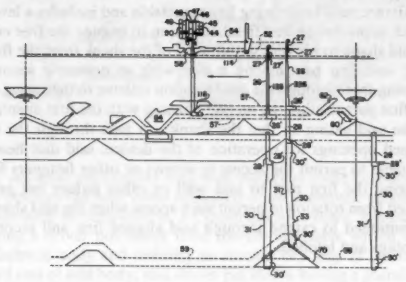
AUXILIARY YARN FEED FINGER AND PATTERN DRUM SLEEVE FOR CIRCULAR KNITTING MACHINES AND METHOD OF KNITTING THEREWITH

Jack C. Barbee, Gastonia, and Gene E. Hart, Charlotte, both of N.C., assignors to Speizman Industries, Inc., Charlotte, N.C.

Filed May 12, 1980, Ser. No. 148,781

Int. Cl.³ D04B *9/34, 9/38, 15/00, 15/74*

U.S. Cl. 66—224 **21 Claims**



18. In method of knitting circular fabric on a circular knitting machine of the type having a rotatable needle cylinder, a plurality of needles carried in said cylinder, and a knitting station, wherein yarns are selectively and independently fed to said needles at said knitting station and said needles are selectively positioned in axial projection from an end of said cylinder at either a basic position for receiving for knitting yarn fed at a basic yarn feeding level spaced from said end of said cylinder or an extended position in which said needles project from said end of said cylinder to a greater axial extent than in said basic position for receiving for knitting both pattern yarn fed at a pattern yarn feeding level spaced farther from said end of said cylinder than said basic level and base yarn fed at said basic level, the improvement comprising feeding a pattern background yarn at a yarn feeding level more closely spaced from said end of said cylinder than said basic level for receipt by needles at said basic position for knitting without being received for knitting by needles at said extended position whereby said pattern background yarn floats behind loops of said pattern yarn formed by the needles at said extended position that receive said pattern yarn.

4,328,687

LOCKING DEVICE

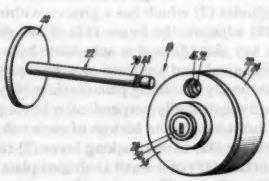
Ian C. Ritchie, 55 Barmah St., Mt. Eliza, Victoria, Australia

Filed Jul. 16, 1979, Ser. No. 57,845

Claims priority, application Australia, Jul. 31, 1978, PD5300

Int. Cl.³ E05B *73/00*

U.S. Cl. 70—34 **7 Claims**



1. A locking device comprising a first part securable to a wall or other fixture and a second part which is releasably retainable by the first part and is so shaped that when so retained, and the first part is secured to said fixture, the second part can extend through the trigger guard of a firearm to secure the firearm to the fixture, the first part including a

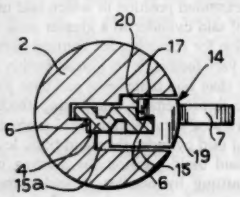
casing securable to the fixture and having a first opening therein, the second part including an elongate shank with an enlarged portion at one end, a free end of the shank remote from the head portion being passable through the said trigger guard and receivable in the said first opening in the first part, a latch being provided for releasably latching the so received said free end to the first part so that, when the first part is mounted on the said fixture and the shank portion passed through the trigger guard and latched to the first part, the enlarged head portion prevents removal of the firearm from the fixture; said latch being key actuatable and includes a lever which is pivotal by key freed actuation to engage the free end of said shank to prevent withdrawal of the shank from the first part; said first part having a disc with an eccentric second opening therethrough for axial rotation relative to the casing of the first part to align the second opening with the first opening in the said casing so that the shank can pass through the so aligned openings for operation of the device, said disc being rotatable to permit the access to screws or other fasteners for securing the first part to said wall or other fixture but prevented from rotation to permit such access when the said shank is positioned to extend through said aligned first and second openings and latched.

4,328,688

ANTITHEFT DEVICE FOR MOTOR VEHICLES

Guiseppe Maiocco, Rivoli, Italy, assignor to Arman S.p.A., Druento, Italy

Filed Jan. 21, 1980, Ser. No. 113,754
Claims priority, application Italy, Feb. 13, 1979, 67314 A/79
Int. Cl.³ B60R *25/02*
U.S. Cl. 70—252 **3 Claims**



1. An antitheft device of the type that includes a latch which is resiliently urged into locking relationship with the steering column of an associated motor vehicle and a rocking lever having, at each of its ends, a projection directed towards the interior of the antitheft device, one of the projections being a lock which is engagable to retain the latch in its unlocked position, and the other acting as a finger which is operable to sense the presence of an ignition key in the key slot of an associated locking device, characterized in that:

(a) the associated locking device comprises a rotatable locking cylinder (2) which has a groove within guide surfaces (16, 18) adjacent the finger (12) of the rocking lever (7) and a key slot (3), and is actuatable by a key (4) having two identical and opposed notched profiles (5) and a longitudinally extending plane surface (6) projecting laterally and substantially perpendicular to the plane of the key (4) at substantially the bottom of each notched profile (5),

(b) the finger (12) of the rocking lever (7) rests on the exterior surface (19) of a small U-shaped plate (14) which has legs (15, 17) of different lengths, and is mounted in the groove within the guide surfaces (16, 18) in the rotatable cylinder (2) for radial sliding movement from a retracted position wherein an interior portion of the shorter leg (17) of said plate (14) projects into the key slot (3) to an extended position wherein the exterior surface (19) of said plate (14) urges the rocking lever (7) into a position where the lock (10) thereof is operable to retain the latch in its unlocked position, the rocking lever (7) being operable to urge said plate (14) towards its retracted position, and

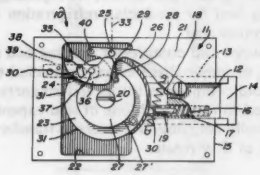
(c) the shorter leg (17) of said plate (14) has a guiding surface (20) which, when the key (4) is inserted in the key slot (3), rests on the one of the plane surfaces (6) of the key (4) which is nearer the rocking lever (7), and is driven thereby to slide said plate (14) to its extended position, while said longer leg (15) is guided in the groove by one of the guide surfaces (16, 18).

4,328,689

SPRING BOLT COMBINATION LOCK

Hans Keller, 4437 Chauvin St., and Claude Legault, 4960 Lalande, both of Pierrefonds, Quebec, Canada

Filed Dec. 20, 1979, Ser. No. 105,649
Int. Cl.³ E05B *37/08, 43/00*
U.S. Cl. 70—303 A **9 Claims**



1. A combination lock comprising a lock housing, a spring biased bolt having a locking free end, said bolt being spring biased for sliding movement so that said locking free end moves out of said housing, a manually operable combination element outside said housing for operating a combination mechanism to assume a predetermined condition within said housing, bolt retracting cam means operable from outside said housing; a bolt retracting element secured to said bolt and engageable by said bolt retracting cam means, when said combination mechanism is operated to said predetermined condition, for retracting said locking free end in said housing by displacing and holding said cam means, disengagement means to disengage said bolt retracting element from said retracting cam means after said locking free end is retracted in said housing to a predetermined position and said cam means is no longer held, a timer mechanism having a time adjustment means disposed on a side of said lock housing opposite the side having said manually operable combination element to set the timer for a predetermined time of operation, a displaceable cam element continuously displaceable by said timer when operative; a lock mechanism disengaging member having an engagement end to hold said bolt retracting element inoperative, a cam activated end displaceable by said displaceable cam whereby said bolt retracting element is held inoperative for a predetermined time set by said adjustment means, said disengaging means being a pivoted link arm, and a cam follower element in displaceable engagement with said cam element and engaging said cam activated end.

4,328,690

REMOVABLE CORE CYLINDER LOCK

Roy N. Oliver, P.O. Box 1075, Salem, Va. 24153

Filed Aug. 4, 1980, Ser. No. 175,220
Int. Cl.³ E05B *27/04*
U.S. Cl. 70—369 **5 Claims**

1. A removable core cylinder lock comprising:

(a) a cylinder lock shell have a cavity therethrough for reception of a cylinder lock case;

(b) means defining a retaining recess in the wall of the cavity intermediate the ends of the shell;

(c) an interchangeable cylinder lock case with an outside configuration to slidably fit into the cavity into the shell, the case including a plurality of pin tumbler holes and an

interrupted cylindrical shape passage extending lengthwise of the case;

(d) a cylinder locking retainer having parallel pin tumbler holes and a cylindrical shaped passage shaped to correspond with the interrupted cylindrical shaped passages in the lock case to form a completed cylindrical passage through the lock case and retainer, the retainer being rotatable in the shell to a limited extend;

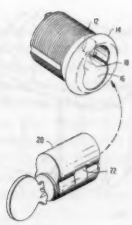
(e) a projection on the outer surface of the cylinder retainer for cooperating with the retainer recess when the retainer is rotated in one direction and clearing the retainer recess when the retainer is rotated in an opposite direction;

(f) means defining a latch bar groove in the wall of the completed cylindrically shaped passage in the lock case and retainer;

(g) twisting pin tumblers each having a pointed inner end and a longitudinal groove, one pin tumbler positioned in each pin tumbler hole in the lock case and retainer;

(h) a driver pin in each of the pin tumbler holes above the pin tumbler and means for biasing the driver pins and pin tumblers toward the longitudinal center of the case;

(i) a latch bar having projections from one side thereof cooperating with the longitudinal grooves in the pin tumblers when the tumblers are correctly oriented by a twisting movement, the opposite side of the latch bar from the



projection being shaped to cooperate with the latch bar groove such that when any one projection is not in a tumbler groove, the latch bar will be kept seated in the latch bar groove

(j) a cylinder having a key way, pin tumbler holes, a slot for lateral movement of the latch bar, and an outside cylindrical surface for rotary movement inside the completed cylindrical passageway in the case and the retainer;

(k) an operating key having at least some bits cut at skew angles to cause the tumblers to raise to a shear line defined by the outside surface of the cylinder and the completed cylindrical passage and to twist to present the longitudinal groove to the latch bar projections at each tumbler position thereby allow the operating key to rotate the cylinder and operate the locks;

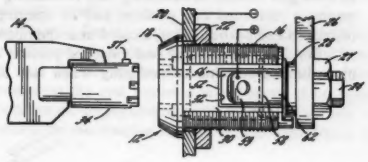
(l) a control key having its bits cut at the same angles as the operating key, the bits causing the tumblers to raise to a core removal shear line defined by the surface of the retainer and a cooperating surface of the case for at least one tumbler and defined for the remaining tumblers by the outside surface of the cylinder and the completed cylinder passage, and to cause the tumblers to twist to present the longitudinal groove of each tumbler to the latch bar projections to allow the key to retract the retainer projection from the recess and allow the core to be removed.

4,328,691

ALARM SWITCH MECHANISM FOR AXIAL PIN TUMBLER LOCKS

Frank J. Scherbing, Cook County, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Aug. 6, 1980, Ser. No. 175,761
Int. Cl.³ E05B *27/08*
U.S. Cl. 70—363 **5 Claims**



1. An axial pin tumbler lock with electrical switch capabilities through the pins when subjected to an attempted picking, comprising in combination, a cylindrical lock body, a spindle having a driver pin sleeve fixed thereto insertable within the cylindrical body and defining an annular key way at the forward end of said body, said driver pin sleeve having a plurality of bores for receiving the driver pins, an annular stationary sleeve of insulating material with corresponding locking pin bores surrounding the spindle adjacent to the driver pin sleeve and fixed to the lock body, a plurality of stemmed locking pins disposed in the bores of the stationary sleeve and urged forwardly by spring means so that the locking pins normally project into the spindle sleeve bores preventing rotation of the spindle until a proper key inserted in the key way urges the locking pins through the driver pins into a shear plane between said sleeves to permit rotation of the spindle, an electrical contact element mounted at the rearward end of the stationary sleeve, said contact element having passages therethrough aligned with the locking pin stems, an insulating ring member fixedly mounted for rotation with the spindle, and said insulating ring member having a plurality of bores corresponding to the passages in the contact element so that when said locking pins are urged rearwardly beyond the shear plane such as in an attempted picking the stems move through the contact element passages into said insulating ring bores closing an electrical circuit between the contact element and said pin stems restrain the spindle from rotation by protruding into the insulating ring bores.

4,328,692

BOOBY-TRAPPED LOCK CYLINDER WITH INTEGRAL INTRUSION DETECTOR

Harry E. Dice, 3552 Oak Dr., Edgewater, Md. 21037, and George K. C. Hardesty, P.O. Box 130, Mayo, Md. 21106

Continuation-in-part of Ser. No. 895,708, Apr. 12, 1978, Pat. No. 4,194,379. This application Mar. 24, 1980, Ser. No. 132,886
Int. Cl.³ E05B *63/00*
U.S. Cl. 70—421 **23 Claims**

1. A key operated lock cylinder comprising:

a shell having a longitudinally extending bore;

a plug rotatively mounted in said bore and having a keyway including an opening for insertion of a key, said plug having a locked position and an unlocked position;

locking means for restraining said plug in said locked position, said locking means being released when a key corresponding to said locking means is fully inserted into said keyway;

a rotation-limiting pin radially mounted in said shell;

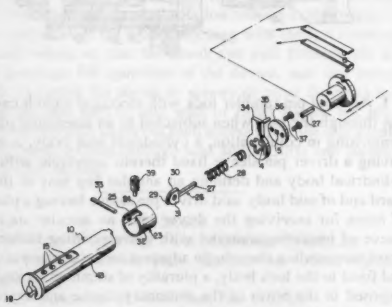
restraining notch means in a first labyrinth means operatively associated with said rotation limiting pin to prevent rotation of said plug to said unlocked position;

resilient means for biasing engagement of said pin and labyrinth means to normally hold said rotation limiting pin in said restraining notch means;

said corresponding key displacing the relative positions of said pin and restraining notch means longitudinally of said bore, when said key is fully inserted, so that said pin is out of said restraining notch means and said labyrinth means to allow said plug to rotate to said unlocked position; and

a collar slidably mounted in said shell and operatively coupled to rotate with said plug, said collar including;

said first labyrinth means formed in said collar and having an enlarged portion constituting said restraining notch means, a restricted end portion, and an opening, said restricted end portion being located near the opening of said first labyrinth means, said enlarged portion allowing a limited rotation of said plug when said locking



means is released, said restricted end portion preventing the movement of said pin out of said first labyrinth means unless said plug is positioned in said locked position;

second labyrinth means for receiving said rotation limiting pin when said collar is depressed farther than said corresponding key would depress said collar when fully inserted into said collar; and

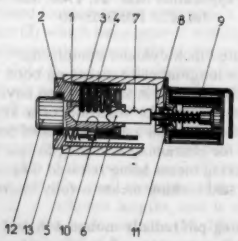
a slot positioned between said first labyrinth means and said second labyrinth means, said slot allowing said collar to rotate with said plug to said unlocked position when said collar is displaced a predetermined distance longitudinally of said bore by said corresponding key.

4,328,693

ELECTRICALLY ACTUATED LOCK

Paul Lipschutz, Croissy, France, assignor to Neiman S.A., Courbevoie, France

Filed May 17, 1979, Ser. No. 39,976
Claims priority, application France, Jun. 8, 1978, 78 17253
Int. Cl.³ E05B *17/00*
U.S. Cl. 70—431 **1 Claim**



1. In a lock mechanism comprising a body, a rotor rotably mounted within a bore formed in said body and being operatively connected with a movable lock piston and movable between a locking position and an opening position, said body having a key-receiving slot formed axially therein, the provision of:

(a) a plurality of locking members in the form of pairs of opposed pistons mounted within aligned bores in said body and said rotor,

(b) a key shank provided with coded notches, movable into said key-receiving slot,

(c) an electromagnet having an armature connected to said key shank for axial movement thereof to bring the latter into and out of engagement with said locking members, and

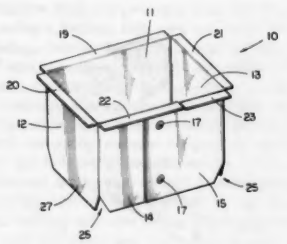
(d) a head provided on said rotor and extending from said lock, which head is manually rotatable when said key shank is in engagement with said locking members.

4,328,694

OUTLET TUBE AND METHOD

Peter W. Beaumont, 6806 1st Ave., North, Birmingham, Ala. 35206

Filed Jun. 9, 1980, Ser. No. 157,569
Int. Cl.³ B21D *51/38*
U.S. Cl. 72—379 **2 Claims**



1. A method for facilitating the connection of a gutter with a downspout by means of an outlet tube which comprises the steps of:

a. providing a unitary, flat member having a first edge, the member including four spaced apart separation regions extending inwardly from the first edge and dividing the member into five wall portions, the member further including notches aligned opposite the separation regions;

b. forming flanges extending outwardly of the wall portions of the member;

c. folding the flat member into a rectangular shape with the separation regions at the corners of the rectangular shape, the two end wall portions comprising one side of the rectangular shape and the other three wall portions forming the other three sides of the rectangular shape, the two end wall portions being folded to overlap, the separation regions comprising score lines and the folding of the wall portions into a rectangular shape causing the flanges to separate at the score lines;

steps b. and c. comprising folding the flat member into a generally L-shaped configuration with one portion of the L-shape including the wall portions and the other portion of the L-shape including the flanges, and then folding the wall portions of the member into a rectangular shape;

d. securing together the overlapped end wall portions to retain the member in the rectangular shape; and

e. folding the portions between the notches inwardly to form a tapered end of the rectangular shape.

4,328,695

PUNCH ADAPTOR FOR FOLDING MACHINE

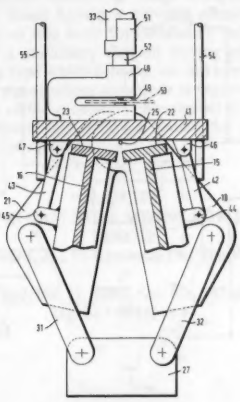
Graham J. Beaumont, Sheffield, England, assignor to Keeton Sons & Co. Ltd., Sheffield, England

Filed May 6, 1980, Ser. No. 147,424

Claims priority, application United Kingdom, May 16, 1979, 7917002

Int. Cl.[3] B21D 7/06, 37/00

U.S. Cl. 72—389 3 Claims



1. In a folding machine of the kind comprising a pair of forming members mounted for pivotal movement in opposed directions about a common pivot axis from a rest position in which the upper surfaces of the forming members are co-planar to a forming position in which the said upper surfaces are inclined to each other, the improvement which comprises a horizontal platten arranged above the forming members connection means operatively interconnecting the horizontal platten to the forming members so as to move said platten vertically on pivotal movement of the forming members, a punch and die set arranged on the platten and a stationary abutment for the punch above the platten.

4,328,696

METHOD AND APPARATUS FOR FORMING A HEAT SHIELD PLATE

Charles J. Gonwa, Palos Hills; Kenneth L. Baker, Winfield, and Ronald A. Sieloff, South Elgin, all of Ill., assignors to Maremont Corporation, Chicago, Ill.

Filed Feb. 23, 1981, Ser. No. 236,981

Int. Cl.[3] B21O 9/05

U.S. Cl. 72—389 10 Claims

1. A method of making a heat shield for use in an exhaust system which comprises the steps of:

positioning a blank of sheet metal between a die having forming surface means of generally arcuately concave cross-sectional configuration which extends in a generally arcuately convex direction and a straight cylindrical body of elastomeric material having a longitudinal axis extending generally tangentially with respect to the arcuately convex direction of extent of said die forming surface means,

effecting an initial relative movement between said die and said cylindrical elastomeric body in a direction toward one another so as to compress a central portion of said sheet metal blank to a central portion of said die forming surface means by a central portion of the exterior surface of said cylindrical elastomeric body while the latter is in a straight condition, and

progressively flexing opposite end portions of said cylindrical elastomeric body in directions toward the end portions of said die forming surface means so as to progressively compress the end portions of the sheet metal blank into conformed engagement with said die forming surface means by the exterior surface of said elastomeric body.

4,328,697

TRANSDUCER CALIBRATION DEVICE

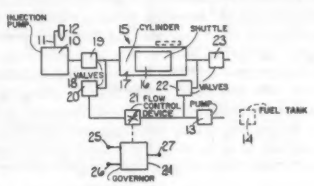
Brian W. Tumber, Greenford, and Michael J. Davison, London, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 13, 1980, Ser. No. 129,990

Claims priority, application United Kingdom, May 23, 1979, 7917902

Int. Cl.[3] G01F 25/00

U.S. Cl. 73—3 14 Claims



1. A transducer calibration device for use with a transducer means associated with a metering device of a liquid fuel injection pumping apparatus, the apparatus being of the kind comprising an injection pump which in use delivers fuel at high pressure to an associated engine, a source of fuel at low pressure, a metering device comprising a shuttle slidable within a cylinder, valve means operable in timed relationship with the injection pump to allow fuel to flow from one end of the cylinder to the injection pump during a filling period of the injection pump and to allow fuel to flow from said source to said one end of the cylinder during the period between successive filling strokes of the injection pump and means for controlling the rate of fuel supplied to said one end of the cylinder, said transducer means including a transducer and an electrical circuit to which the output of said transducer is supplied and which supplies an output signal indicative of the position of the shuttle within the cylinder, the calibration device comprising first means for sampling said output signal when the shuttle has moved a predetermined distance away from said one end of the cylinder, second means for comparing the sampled signal with a reference signal, third circuit means for determining from a difference signal provided by said second means, a correction signal which is applied to said electrical circuit and fourth circuit means for holding the signal applied to the electrical circuit constant at least until the output signal is again sampled.

4,328,698
PRESSURE CALIBRATION DEVICE

Durwood B. Bruton, 9916 Fieldcrest, Dallas, Tex. 75238

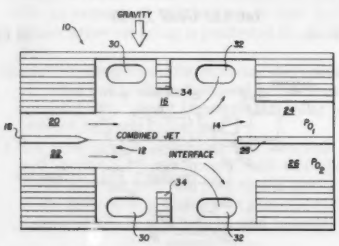
Filed Sep. 5, 1980, Ser. No. 184,538
Int. Cl.³ G01L 27/00
U.S. Cl. 73—4 R 6 Claims

2. A device for calibrating and/or testing a pressure-responsive transducer comprising a barrel member having a stepped internal bore defining a large diameter chamber and an elongate, smaller diameter chamber, a piston movable through said small diameter chamber to vary the effective volume thereof and means for indicating the extent of movement of the piston through the chamber and hence the increase of pressure within the bore.

4,328,699
FLUERIC DENSITY AND FORCE SENSOR

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 23, 1980, Ser. No. 161,793
Int. Cl.³ G01N 9/00; G01P 15/03
U.S. Cl. 73—30 7 Claims



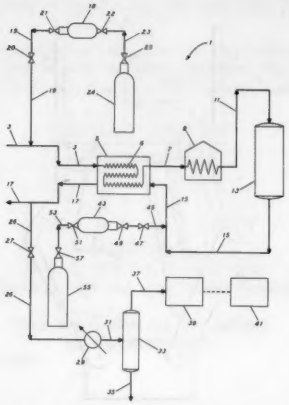
1. A laminar flueric density sensor comprising:
a nozzle with a divider for emitting a sample fluid and a reference fluid from a respective side of said divider as a single laminar jet;
sensing means disposed downstream for sensing deflection of said jet about the nozzle's centerline as an indication of relative density of said sample fluid and said reference fluid; and
a chamber interconnecting said nozzle and said sensing means for accomodating deflection of said jet.

4,328,700
LEAK DETECTION METHOD AND APPARATUS

Bernard A. Fries, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 14, 1977, Ser. No. 777,389
Int. Cl.³ G01M 3/22
U.S. Cl. 73—40.7 2 Claims

1. In a fluid processing system wherein fluids flow in a first path and a second path, with a partition separating a portion of said first path from a portion of said second path, the method for detecting leakage through said partition while continuing operation of said system, which comprises the steps of:
(1) introducing sulfur hexafluoride into said second path upstream of said partition;
(2) continuously sampling fluid at a sampling locus;
(3) testing the resulting calibration sample for the presence of sulfur hexafluoride;
(4) measuring the period of time after step (1) until the presence of sulfur hexafluoride is detected in step (3);
(5) estimating the period of time required for sulfur hexafluoride introduced into said first path upstream of said partition to reach said sampling locus if an opening exists between said first and second paths through said partition;

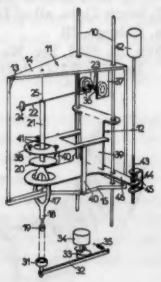


(6) introducing sulfur hexafluoride into said first path upstream of said partition;
(7) sampling fluid in said second path at said sampling locus downstream of said partition; and
(8) testing said sample for the presence of sulfur hexafluoride.

4,328,701
APPARATUS FOR DETERMINING THE BEHAVIOR OF A LIQUID DURING COAGULATION AND THE LIKE

Do Mau-Tung, and Do M. Lam, both of Velizy, France, assignors to Societe Probio DMS, France

Filed Apr. 25, 1980, Ser. No. 143,750
Claims priority, application France, Apr. 27, 1979, 79 10915
Int. Cl.³ G01N 11/10, 33/48
U.S. Cl. 73—59 9 Claims



1. Apparatus for determining the viscous behaviour of a liquid during coagulation and lysis thereof and the like, including:
support means,
vertical torsion means stretched between an upper anchoring point and a lower anchoring point on said support means,
an oscillatory body located below the lower anchoring point

and suspended to said vertical torsion means, whereby said torsion means tend to return said body to a predetermined angular position about the axis of the torsion means,

means for supporting a vessel for said liquid and for imparting to said vessel an oscillatory movement of predetermined frequency and amplitude substantially about said axis, and

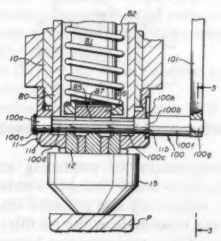
amplitude measuring means for measuring the amplitude of the oscillations of said body when immersed in said liquid, said amplitude measuring means comprising electrical induction means having a movable element operatively connected to said body for oscillatory movement therewith and a stationary element having output terminal means of a type which delivers, on said terminal means, an electrical signal whose amplitude is representative of the amplitude of the oscillatory movements of said body and further comprising electrical means for measuring the amplitude of said electrical signal.

4,328,702

OPERATING CAM STOP MEANS FOR HARDNESS TESTER

Robert M. Edward, Jr., 18 Kittiwake Ct., The Woodlands, Tex. 77380

Filed Jul. 11, 1980, Ser. No. 167,652
Int. Cl.³ G01N *3/44*
U.S. Cl. 73—83 **9 Claims**



1. An operating cam for use with a hardness tester of the type having a tubular housing in which is carried a load cell having major and minor load springs and to the lower end of which is attached a housing closure and a penetrator assembly which includes a reciprocating penetrator and a plunger rod engageable with said penetrator, said penetrator being movable between no load, minor load and major load positions, for measuring hardness properties of materials to be tested by said tester in response to loads applied by said load cell through said plunger rod, said operating cam being movable between no load, minor load and major load positions, in which no load, minor load and major load forces, respectively, of said load cell are applied to said penetrator through said plunger rod, said operating cam extending through a hole in said plunger rod perpendicular to the axis of said plunger rod, and rotatingly supported in first and second cylindrical holes through said housing closure on opposite sides of said plunger rod, said operating cam comprising:

first and second cylindrical journal portions for disposition within said first and second cylindrical holes, respectively;

a substantially cylindrical cam portion of smaller diameter between said journal portions and the axis of which is eccentric to the axis of said journal portions;

an end portion adjacent said second journal portion having a common axis with said journal portions and having means thereon for rotating said cam member about said common axis between said no load, minor load and major load positions; and

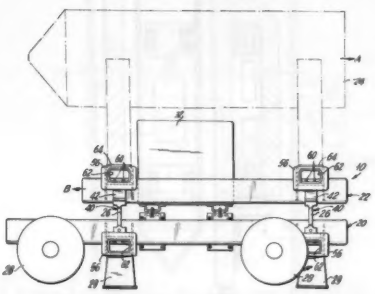
cam stop means adjacent said end portion including at least one stop member projecting radially from one part of said end portion and engageable with corresponding stop means on said housing for limiting rotation of said operating cam between said no load and major load positions.

4,328,703

THRUST MEASURING TEST STAND

John W. McClure, Houston, Tex., and George S. Hudson, Hamden, Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Feb. 14, 1980, Ser. No. 121,358
Int. Cl.³ G01L *5/13*
U.S. Cl. 73—117.4 **6 Claims**



1. A test stand for measuring the thrust produced by a jet engine comprising:

a rectangular base;

a rectangular floating frame disposed in parallel spaced relationship to the base, with the engine being mounted to said floating frame;

a set of four elongated support flexures interconnecting the base and the floating frame adjacent the corners thereof and disposed perpendicular thereto, each of said support flexures including first and second elongated generally planar webs, with the plane of said first web being orthogonal to the plane of said second web and with said first web being perpendicular to the longitudinal axis of the engine, whereby the operation of the jet engine causes movement of the floating frame relative to the base and parallel to the longitudinal axis of the engine thereby resulting in a corresponding bending of the flexures, localized in said first web portion thereof for facilitating the measurement of said bending;

a first pair of transducers bonded to the planar surface of the first web of each flexure, said first pair of transducers constructed to generate a signal proportional to the bending of the first web;

a second pair of transducers bonded to the opposing planar surface of the first web of each flexure, said second pair of transducers constructed to generate a signal proportional to the bending of the first web; and

control means connected to the transducers of each flexure to receive the signals therefrom and to generate a signal indicative of the thrust of the engine.

4,328,704

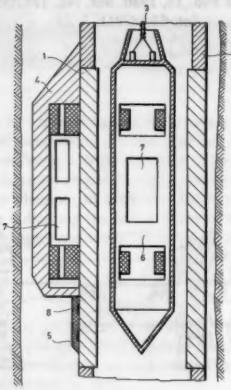
APPARATUS FOR MEASURING THE DEFORMATION AND STRESS CONDITION OF THE STRING OF CASING OF DRILLED OIL WELLS

Miklos Arpasi, and Geza Rakar, both of Budapest, Hungary, assignors to Országos Köolaj és Gázipari Tröszt, Budapest, Hungary

Filed Feb. 11, 1980, Ser. No. 120,632
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **2 Claims**

1. An apparatus for the in situ measurement of the deformation and stress conditions of a string of casings in a drilled oil well, comprising: an antimagnetic measuring section mount-

able in a string of casings at a selected depth and having a mantle, extensometers fixed on the mantle and a first electronic unit including printed circuits mounted on the measuring section and receptive of the outputs of the extensometers for transforming amplitude variations to frequency variations and for transmitting the frequency signal; and a drill hole probe extendable into the interior of the string of casings to the depth



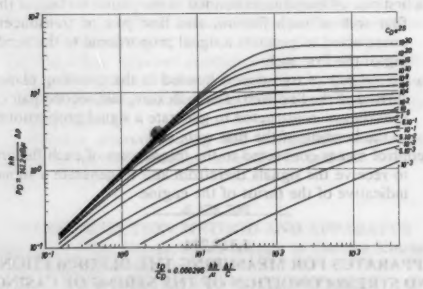
of the measuring section and having an electrical cable fixed thereto and having a sufficient length to reach the surface when the probe is at the desired depth, means for transmitting energy from the cable to the first electronic unit to energize same to transmit the frequency signal and a second electronic unit receptive of the transmission from the first electronic unit for applying the frequency signal to the cable for processing at the surface.

4,328,705

METHOD OF DETERMINING CHARACTERISTICS OF A FLUID PRODUCING UNDERGROUND FORMATION

Alain C. Gringarten, Melun, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Aug. 11, 1980, Ser. No. 177,040
Int. Cl.³ E21B *49/00*
U.S. Cl. 73—155 **8 Claims**



1. A method for determining physical parameters of a fluid producing underground formation traversed by a wellbore comprising:

changing the fluid flowrate from the formation,

plotting the subsequent variations in fluid pressure versus time change as a curve in log-log axes on an experimental graph,

matching the curve on the experimental graph to one of a series of type-curves representing, on one axis, the pressure change times the product permeability-thickness of a formation, and on the other axis, the time change times the ratio of the product permeability-thickness to the wellbore storage constant, and

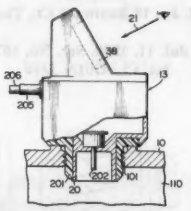
determining from the matched type-curve and the shifts of the axes between the experimental graph and the axes of the matched type-curve at least one of the following values of the fluid producing underground formation: the product permeability-thickness, the wellbore storage constant, and the skin value.

4,328,706

TACHOMETER SUITABLE FOR USE IN ENGINE MAINTENANCE

Sigeyuki Akita, Okazaki, and Junji Kitagawa, Aichi, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 14, 1980, Ser. No. 149,698
Claims priority, application Japan, Jul. 27, 1979, 54-96360
Int. Cl.³ G01P *3/26*
U.S. Cl. 73—493 **8 Claims**



1. A tachometer suitable for use in engine maintenance, comprising:

pressure sensing means for producing an electric signal representing the pressure changes within said engine;

a member for supporting said pressure sensing means, said member being mountable at the oil filler port of said engine for providing communication between said pressure sensing means and the interior of said engine,

means connected to said pressure sensing means for computing the rotational speed of said engine in accordance with said signal of said pressure sensing means; and

display means responsive to said computing means for displaying the rotational speed of said engine, said display means being located within the engine compartment thereby facilitating said maintenance.

4,328,707

ULTRASONIC IMAGE RECONSTRUCTION METHODS AND APPARATUS

Michel Clement, Montigny le Bretonneux, and Pierre Alais, Dampierre, both of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly sur Seine, France

Filed Jun. 18, 1979, Ser. No. 49,304
Claims priority, application France, Jun. 20, 1978, 78 18424
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—618 **14 Claims**

1. A ultrasonic image reconstruction tomography apparatus for passing ultrasonic energy bursts in a transverse cross-sectional plane of an object and reconstructing the two-dimensional distribution of the values of at least one parameter of said object, comprising:

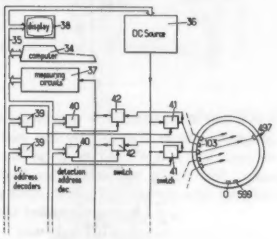
a plurality of ultrasonic energy probes distributed at substantially equal angular intervals along a crown having an axis arranged to be placed perpendicularly to said cross-sectional plane,

means for generating successive electric pulses,

means associated with said pulse generating means and with said probes for applying each said pulse to a group of said

probes including a central transmitting probe and adjacent transmitting probes, said associated means including focusing means arranged to pass said pulse to the adjacent transmitting probes with time delays to provide focussing of the energy in a particular direction such that said group of probes delivers an ultrasonic burst in the form of a beam directed toward and having a focal point at least one associated probe diametrically opposed to said group of probes,

receiving means connected to said probes for collecting signals received by said at least one associated probe in response to each burst passed through said cross-sectional plane from one said group of probes,



scanning means for changing one at least probe of said group of probes connected to receive said pulse and for changing said at least one associated probe connected to the receiving means after each burst,

memory means for storing the successive signals collected by said receiving means, and

means for recontructing the distribution of the values of said parameter in said cross-section by processing the stored signals,

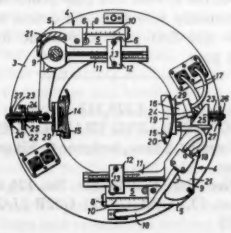
whereby reconstruction is achieved from the measurements on said beams directed at different angles in the cross-sectional plane without moving the probes.

4,328,708

ROTARY ULTRASONIC TESTING APPARATUS

Alan D. Bagwell, Taunton, England, assignor to British Steel Corporation, England

Filed May 27, 1980, Ser. No. 153,292
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—622 **7 Claims**



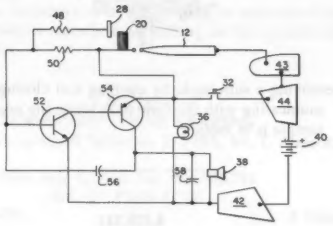
1. A rotary ultrasonic testing apparatus including an annular stator; an annular rotor mounted on the stator for rotation about a workpiece to be tested as it is moved through the stator and rotor; and an ultrasonic probe assembly mounted for rotation with the rotor, said probe assembly comprising a cranked arm pivotally mounted at the crank thereof upon a bearing pin having an axis parallel to the axis of the rotor, the cranked arm carrying towards one end an adjustable counterweight and at the other end an ultrasonic probe block and guide shoe for facing to the surface of the workpiece, said bearing pin being adjustable in position relative to the rotor axis, spring means for limiting movement of the arm about the bearing pin, and water supply means connected to the probe pad.

4,328,709

ELECTRONIC AUDIO VISUAL TORQUE INDICATOR ADAPTER

Wayne E. Schramm, 8427 Frost Way, Annandale, Va. 22003

Filed Apr. 18, 1980, Ser. No. 141,358
Int. Cl.³ B25B *23/142*
U.S. Cl. 73—862.23 **8 Claims**



1. A device for indicating the deflection of a pointer on a tool or instrument having a pointer and indicating plate, comprising:

a body,

means for securing said body to said indicating plate,

a battery mounted to said body,

a first terminal attached to said body and electrically connected to a first pole of said battery, said first terminal being positioned on said body so as to electrically connect to said pointer when the body is secured to the indicating plate,

a second terminal attached to said body and positioned to contact and electrically connect to said pointer when the pointer is deflected a preset amount, and

a circuit mounted to said body, said circuit being electrically connected to a second pole of said battery and said second terminal, and said circuit outputs a first sensory signal when contact between the pointer and said second terminal electrically connects the circuit to said first pole of the battery.

4,328,710

HOMOGENIZER/SUBSAMPLER FOR TAR SAND PROCESS STREAMS

Lubomyr M. O. Cymbalisty, and Robert C. Shaw, both of Edmonton, Canada, assignors to Petro-Canada Exploration Inc., Calgary; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton; PanCanadian Petroleum Limited, Calgary; Esso Resources Canada Ltd., Calgary; Canada-Cities Service, Ltd., Calgary and Gulf Canada Resources Inc., Calgary, all of, Canada

Division of Ser. No. 90,923, Nov. 5, 1979, Pat. No. 4,284,360.
This application Apr. 2, 1981, Ser. No. 250,241
Int. Cl.³ G01N *1/20*
U.S. Cl. 73—863.86 **1 Claim**

1. A method of subsampling a tar sands hot water extraction plant stream comprising:

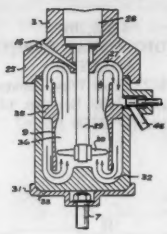
collecting a bulk sample of the stream in an open-topped vessel;

connecting the filled vessel to a head element to enclose the bulk sample;

pressurizing the enclosed bulk sample with gas;

homogenizing the bulk sample by circulating it along a

generally elliptical flow path provided by the vessel and head element; and



removing a subsample by opening and closing a port communicating with the flow path while the pressurized bulk sample is in motion.

4,328,711

REDUCTION GEAR

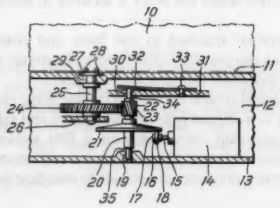
Herbert Machmerth, Solms; Georg Mann, Staufenberg, and Gerhard Salzmann, Solms, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,114

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852493

Int. Cl.³ F16H *15/10*

U.S. Cl. 74—194 **11 Claims**



1. A reduction gear assembly for automatically accommodating varying torsional load conditions on a driven member, comprising:

a rotatably mounted, axially displaceable first shaft;

means for rotatably driving said first shaft by a frictional force engaging in the axial direction of said first shaft, said means comprising a second rotatable shaft positioned at an angle with respect to said first shaft, means for rotatably driving said second shaft, a first driven member attached for rotation to said first shaft and a second driven member attached for rotation with said second shaft and being engaged with said first driven member, at least one of said first and second drive members being elastically deformable;

a driving element mounted for rotation with said first shaft; and

a driven member rotatably driven by said driving element and being subjected to varying load conditions,

said driving element comprising means for axially moving said first shaft to automatically increase and decrease said frictional force in response to an increase or decrease, respectively, in the torsional load conditions on said driven member.

4,328,712

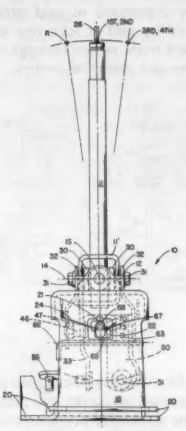
LOCKOUT FOR GIMBAL-TYPE AUTOMOTIVE TRANSMISSION GEAR SHIFTER

Charles Osborn, Spring Lake, Mich., assignor to JSJ Corporation, Grand Haven, Mich.

Filed Jan. 24, 1980, Ser. No. 115,126

Int. Cl.³ F16H *57/06*; G05G *9/16*

U.S. Cl. 74—476 **19 Claims**



1. A cable operating gimbal-type automotive transmission shifter and gear lockout comprising:

a pivotable gear selecting shift lever;

a pivotable shift lever carrier;

first and second generally orthogonal axes;

a base adapted for mounting the transmission shifter in an automotive vehicle;

said shift lever being pivotable relative to said carrier about said first axis;

said carrier being pivotable relative to said base about said second axis;

a first gate disposed on said base;

a detent mounted for reciprocal movement relative to said base;

biasing means for biasing said detent into engagement with said base, said biasing means preventing entry of said detent into said first gate and thus providing a positive first lockout for at least one gear position; and

means for manually actuating said detent and aligning the same with said first gate to provide for entry to the locked-out gear.

4,328,713

CONTROLLING TRANSLATION

Harold Lund, Reading, Mass., assignor to Eikonix Corporation, Bedford, Mass.

Filed Mar. 3, 1980, Ser. No. 126,406

Int. Cl.³ G05G *11/00*; G02B *21/24*

U.S. Cl. 74—479 **8 Claims**

1. Translation controlling apparatus comprising,

first support means for supporting a device to be positioned relative to a predetermined reference plane,

means including first guide means for supporting said device on said first support means for relative displacement along a first axis and including means for providing significantly more resistance to movement of said device toward than from said reference plane,

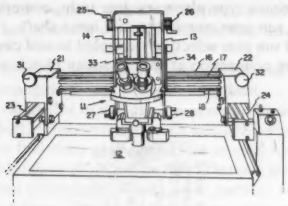
said means fof providing increased resistance comprising one-way clutch means in a means for moving said device toward and from said reference plane,

including,

a worm gear,

a spur gear meshed with said worm gear,

means for coupling said first support means to the gear assembly comprising said worm gear and said spur gear including said one-way clutch means for converting the



rotation of said spur gear to translation of said first support means with said one-way clutch means engaging in response to a force being applied to said first support means directed toward said reference plane and releasing in response to a force being applied on said support means away from said reference plane.

4,328,714

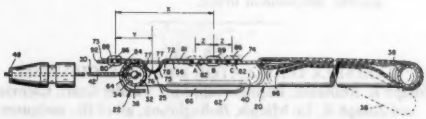
INSTRUMENT ACTUATION ASSEMBLY

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Farmingdale, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,644

Int. Cl.³ F16C *1/10*; B64D *17/62*

U.S. Cl. 74—501 R **16 Claims**



1. An actuation assembly for use in conjunction with an instrument to be actuated, comprising:

A. a handle adapted to be manually gripped by the user of the actuation assembly,

B. housing means adapted to be fixedly secured to a harness or the like and for positioning said handle in a releasably confined position relative to said housing means until use of the actuation assembly is desired,

C. releasing means operatively associated with said housing means so as to maintain said handle in said confined position relative to said housing means so as to obtain upon the application of a predetermined force resilient deflection of said releasing means such that said handle is removable from said confined position, said releasing means being adjustable to provide stepped indexed selection of a force within the range of possible forces necessary to remove said handle from said releasably confined position,

D. coupling means connecting said handle to the instrument to be actuated, such that upon removal of said handle from said confined position beyond said releasing means a force is applied through said coupling means to actuate the instrument,

E. said releasing means includes:

(1) a clip having a pair of spaced apart ends coupled to said housing means and a projection intermediate said ends,

(2) said projection extending in the path through which said handle is to travel when removing same from said confined position, such that resilient deflection of said projection is obtained when a minimum predetermined force is applied to said handle in a given direction,

F. said housing includes:

(1) a base having a front end and spaced apart rear end,

(2) a pair of side arms intermediate said ends and joined to said base, said arms extending upwardly from said base and laterally spaced apart a distance adapted to receive a portion of the handle therebetween,

(3) a front arm formed at said front end of said base,

(4) a slot extending through said base, and

(5) said projection extending through said slot disposed through said base on the same side of said base as said arms, and

G. said base includes one hole extending on one side of said slot and two or more holes extending on the opposite side of said slot.

4,328,715

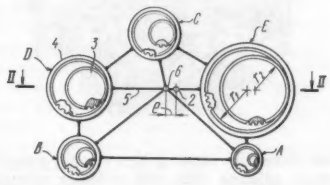
PLANETARY CRANK GEARING

Petr I. Gorkov, prospekt Seifulina, 173-10A, kv. 7, Alma-Ata, U.S.S.R.

Filed Aug. 3, 1978, Ser. No. 930,711

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—674 **6 Claims**



1. Planetary crank gearing for rotation from a single drive shaft to a group of parallel driven shafts spaced from each other comprising, a rotary driven drive shaft, a plurality of parallel driven shafts, for each driven shaft a planetary gear pair, each planetary gear pair comprising a planetary gear driven from said single drive shaft and a sun gear driven by the corresponding planetary gear, a common drive block of planetary gears meshing with each planet gear of each planetary gear pair, the planet gear and sun gear of each planetary gear train being disposed relatively eccentric, and the gear ratios of at least some of the planetary gear pairs being different.

4,328,716

MULTI-SPEED PLANETARY GEAR

Karl G. Ahlen, and Per-Olof Bergstrom, both of Stockholm, Sweden, assignors to S.R.M. Hydromekanik Aktiebolag, Sweden

Filed Oct. 19, 1977, Ser. No. 843,521

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1977, 2733616

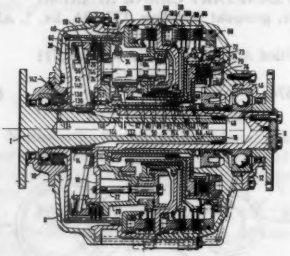
Int. Cl.³ F16H *57/10, 3/44*; F16D *11/00, 13/60*

U.S. Cl. 74—760 **26 Claims**

1. A multi-speed planetary gear transmission comprisisng a casing, primary and secondary shafts, each journalled in the casing, a planet carrier drivingly connected to one of said shafts with at least one planet gear mounted therein, each planet gear having at least two gearings of different diameters, at least three annular gears, one of said annular gears being a drive annular gear drivingly engaged with the shaft other than the one to which the planet carrier is drivingly engaged, each of the remaining annular gears engaging one of the said planet gearings, a direct drive coupling for directly drivingly connecting the drive annular gear and the planet carrier, a coupling associated with each of the said remaining annular gear for connecting it against rotation relative to the casing, servo-

motor means for connecting each of the said couplings, and at least one of said couplings being a friction disc coupling having a first set of disc or discs and a second set of disc or discs, the discs of both sets being mounted on spline connections to be movable axially into and out of engagement with each other to respectively engage and disengage the coupling,

connecting means connecting the said at least one coupling to its respective annular gear, said connecting means including an essentially cylindrical collar located at a distance radially outwardly from said shafts, said collar including axially extending splines, the disc or discs of the first set being mounted on said splines for free axial movement and fixed against rotational movement relative to said collar, and the disc or discs of the second set being mounted by spline means at it or their radial outer sides to a reference member for free axial movement and fixed against rotational movement relative to said reference member, said collar including small radial air flow channels therein for carrying high velocity streams of air between adjacent discs, and including apertures located radially outwardly of the area of engagement of the discs to permit outflow of said air streams from the coupling,



the disc or discs of one of said sets being plane and the disc or discs of the other set having its or their surfaces formed as sinusoidal undulations, taken in the circumferential direction, the amplitude of the undulations in the disengaged position being great enough to permit said air flow entering said air channels to flow into the radially extending spaces between successive undulations, and said amplitude being low enough to allow air to enter in a circumferential direction into the locations between the highest points of each undulation and the plane surface which it faces upon relative rotation of the first and second sets of disc or discs in the disengaged condition of the coupling, whereby such air, passing between the high points of the undulations and the facing plane surfaces acts as an air bearing therebetween.

4,328,717

AUTOMATIC TRANSMISSION

Hajime Arai, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 20, 1979, Ser. No. 31,744
Claims priority, application Japan, Nov. 6, 1978, 53-136426
Int. Cl.³ F16H *57/10, 3/44*
U.S. Cl. 74—760 **2 Claims**

1. A transmission comprising:

a casing;

an input shaft;

an output shaft;

an oil pump driven by said output shaft;

an oil pressure clutch operated by the oil pressure output from the oil pump;

a one-way clutch;

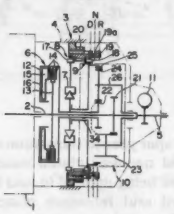
first and second manually operated mechanical brakes selectively engageable independent of oil pressure to place said transmission in forward, reverse or neutral condition, said first and second mechanical brakes comprising first and second spline wheels, respectively;

a shift element guide member attached to the casing and a shift element which slides in said shift element guide member, said shift element selectively engageable with the teeth of the spline wheels to prevent the engaged spline wheel from turning;

a Ravigneaux-type planetary gear train, comprising:

a first sun gear coupled to said input shaft;

a second sun gear selectively coupled to said casing through a series connection of said one-way clutch and said first



mechanical brake and coupled to said input shaft through said oil pressure clutch when oil pressure from said oil pump achieves a predetermined level due to rotation of said output shaft;

first and second planetary pinions being mutually meshed and being respectively meshed with said first and second sun gears;

a carrier supporting said first and second planetary pinions and being coupled to said output shaft; and

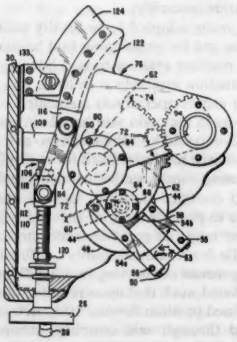
a ring gear meshed with said second planetary pinion and being selectively coupled to said casing through said second mechanical brake.

4,328,718

VARIABLE OSCILLATOR DRIVE MECHANISM

Joseph K. Robinson, Bolingbrook; Max Vander Graff, Glenview, and Joseph R. De Marais, Bolingbrook, all of Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 26, 1980, Ser. No. 181,412
Int. Cl.³ F16H *35/08, 21/44*
U.S. Cl. 74—833 **10 Claims**



1. A variable oscillator drive apparatus comprising in combination:

an oscillator drive having an input shaft, a cam means, and an intermediate shaft, said intermediate shaft characterized as being oscillated by said cam means through a fixed rotation;

an output shaft;

both said input shaft and output shaft characterized as having fixed locations;

crank arm means mounted on said intermediate shaft;

carrier means pivotally supported on said output shaft and positionally adjustable thereabout;

a first drive segment pivotally supported by said carrier member;

a drive block member slidably mounted on said crank arm means and pivotally connected to said first drive segment; and

a second drive segment fixed to said output shaft and drivably connected to said first drive segment;

whereby oscillation of said crank arm means by said intermediate shaft is transferred through said drive block member and said first drive segment to said second drive segment and said output shaft means fixed thereto, and further, a positional adjustment of said carrier member and said first drive segment supported thereby operates to vary the degree of oscillation transmitted to said output shaft.

4,328,719

MICROMOTION MULTIPLIER

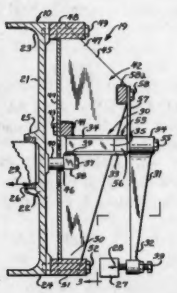
Albert Manna, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00291, § 371 Date Mar. 18, 1980, § 102(e) Date Mar. 18, 1980, PCT Pub. No. WO81/02710, PCT Pub. Date Oct. 1, 1981.

This PCT application filed Mar. 18, 1980, Ser. 206,191

Int. Cl.³ B60K *41/00*; A01B *63/112*

U.S. Cl. 74—845 **17 Claims**



1. In a power transmission apparatus (10) having a power transfer element (26) and a slightly deflectible support (22) for said power transmission element (26), the improvement comprising:

a flexible beam (30) having a first portion (34) and a second portion (33);

means (41,42,43,48,49) for fixing said first portion;

means (37,38,39,40) for moving said second portion to deflect said beam as a function of deflection of said support (22) as a result of power transfer by said apparatus (10);

an arm (31);

connecting means (54,55,56) connecting said arm (31) to said flexible beam (30) to define a motion multiplier wherein a portion (32) of said arm (31) spaced from said connecting means (54,55,56) is moved as a multiple of deflection of said deflectible support (22); and

a motion-responsive control means (27) operated by said arm portion (32).

4,328,720

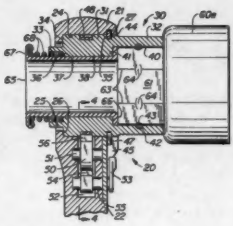
SOCKET WRENCH AND SET

Walter P. Shiel, 1050 Columbus Ave., San Francisco, Calif. 94133

Filed Mar. 17, 1980, Ser. No. 131,193

Int. Cl.³ B25B *13/00*

U.S. Cl. 81—63 **1 Claim**



1. A socket wrench, including in combination a handle terminating in an annular generally circular head,

a hollow one-piece drive ring retained in said head and rotatable therein in both directions, said drive ring having a ratcheted outer peripheral portion and an interior female socket having a prismatic driving inner periphery at one end and a circular cylindrical inner periphery at the other end joined by a flat shelf, said cylindrical inner periphery having a diameter greater than that of the largest bolt with which said wrench is to be used,

a ratchet pawl mounted on said handle for engagement with said ratcheted outer peripheral portion in each of two positions, one for each direction of rotation,

a series of removable sockets, each having at a first end a prismatic outer periphery sized for fitting in said drive ring socket in driving connection therewith, an inner prismatic periphery at a second end for driving a nut or bolt head, a large circular cylindrical opening nearly as large as the distance between opposing walls of said prism, extending therethrough at said first end to enable passage of a bolt all the way therethrough, and a narrow shelf joining said prismatic inner periphery to said cylindrical opening,

socket retention means in said prismatic inner periphery of said drive ring portion for retaining an installed socket in place while enabling its ready purposeful removal, each said socket having cooperating means for releasably engaging said socket retention means, and

quick release means for releasing said socket from said socket retention means for changing sockets, said quick release means comprising a cylindrical member extending through the cylindrical inner periphery of said drive ring, having a first flange in said socket of said drive ring, against which a said removable socket bears, and a second flange at its opposite end beyond the adjacent face of said drive ring, and a coil spring compressed between said second flange and said drive ring.

4,328,721

PHILLIPS SCREWDRIVER WITH RETRACTABLE SLOTTED SCREW DRIVER BLADE

Frank Massari, 4301 Bayshore Blvd., Tampa, Fla. 33611

Filed Sep. 10, 1980, Ser. No. 185,673

Int. Cl.³ B25G *1/00*

U.S. Cl. 81—439 **8 Claims**

1. A screwdriver for alternate use with Phillips head screws and slotted head screws, said screwdriver including a tubular

shank having front and rear ends and including handle defining means at its rear end and a Phillips head screw engaging tip on its front end of the type defining four equally peripherally spaced, forwardly tapering and generally radially extending Phillips screw head socket arm portion engaging lugs, said tip including a centrally located passage extending therethrough opening rearwardly lengthwise into the interior of said tubular shank and through the central portion of said tip at its forward

end, said passage being generally rectangular in cross section with its major transverse dimension center line substantially bisecting the included angles formed between remote pairs of adjacent lugs, and a rectangular cross section elongated slotted screwdriver blade guidingly lengthwise reciprocal through said passage and forwardly extendable past the forward end of said tip and retractable rearwardly from at least the forward portion of said tip.

4,328,722

APPARATUS FOR FACING AND INTERNAL TURNING

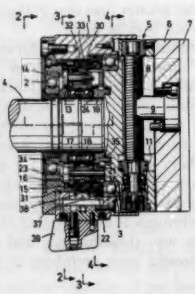
Gerhard Wohlhaupter, Frickenhausen, and Harold Gähr, Unterensingen, both of Fed. Rep. of Germany, assignors to Emil Wohlhaupter & Co., Frickenhausen, Fed. Rep. of Germany

Filed Aug. 29, 1980, Ser. No. 182,578

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1979, 2940827

Int. Cl.³ B23B *3/00, 41/06*

U.S. Cl. 82—2 E **5 Claims**



1. An apparatus for facing and internal turning, the apparatus comprising a stationary casing, a rotatable driven shaft mounted in said casing, a turning head fixed for rotation with said shaft, a tool carriage for carrying a cutting tool displaceable on the turning head transversely to the axis of rotation thereof, and means for effecting the transverse displacement of the tool carriage, wherein said means for effecting transverse displacement of the tool carriage comprise a first and a second planetary gear unit each mounted in a recess in the casing to lie within a respective plane extending at right angles to the axis of rotation of said shaft, each said planetary gear unit comprising a sun gear, a ring gear and at least one planet gear, wherein the sun gear of the first planetary gear unit is fixed for rotation with the shaft, the sun gear of the second planetary gear unit is rotatable relative to the shaft and acts as a driving gear for the tool carriage, and the ring gear of one of said first and second planetary gear units is rotatable in the casing, said means for effecting the transverse displacement of the tool carriage further comprising selectively operable gear means for imparting a rotational speed to the sun gear of the second planetary gear unit which is different from the rotational speed of the sun gear of the first planetary gear unit, said selectively operable gear means comprising at least one further ring gear disposed in said recess in the casing coaxially with said first and second planetary gear units, said further ring gear being rotatable in the casing and having a different number of teeth from that of the ring gears of said first and second planetary gear units, fastening means arranged to selectively lock said further ring gear to said casing, and an additional gear engaged by said further ring gear and connected for rotation with the planet gear of the second planetary gear unit.

4,328,723

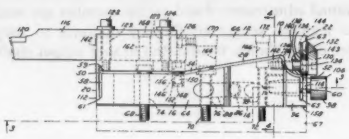
ADJUSTABLE TOOL COMPENSATING ARM

Donald W. Garnett, Grand Ledge, Mich., assignor to The Olofsson Corporation, Lansing, Mich.

Filed Aug. 4, 1980, Ser. No. 174,996

Int. Cl.³ B23B *29/00*

U.S. Cl. 82—36 R **16 Claims**



1. In apparatus of the character described, a relatively rigid yet resilient tool compensating bar of unitary one-piece construction, said bar having first slot means defining a first member adapted to be secured in fixed position on a suitable support, a second member separated from said first member by said first slot means, flexure web means integrally connecting said second member to said first member to permit said second member to flex in a first direction relative to said first member, second slot means defining a third member and separating the same from said first and second members, and flexure web means integrally connecting said third member to said second member to permit said third member to flex in a second direction relative to said second member, said third member being adapted to carry a tool bit.

4,328,724

METHOD AND APPARATUS FOR CUTTING BRICK MOULDINGS FROM A CLAY STRAND

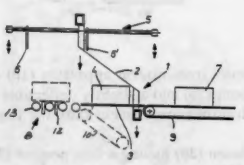
Hans Lingl, Neu-Ulm, Fed. Rep. of Germany, assignor to Lingl Corporation, Paris, Tenn.

Continuation of Ser. No. 52,417, Jun. 27, 1979, abandoned. This application Dec. 3, 1980, Ser. No. 212,343

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828534

Int. Cl.³ B28B *11/14*

U.S. Cl. 83—23 **18 Claims**



1. A method of cutting a block of material comprising the steps of feeding a block of material onto support means including spaced apart supports, subsequently moving a cutting frame, having a predetermined number of tensioned cutting wires positioned at an acute angle to the supports, in a substantially vertical plane from a first starting position to a second position through the block and between the supports so that the cutting wires cut completely through the block without interruption in the cutting motion, and thereafter removing the cut block from the support means, wherein the feeding of the block onto the support means and the removal of the cut block therefrom occurs substantially simultaneously in a single plane by pusher mean».

4,328,725
METHOD OF AND APPARATUS FOR AUTOMATICALLY DISCARDING THE FRONT AND REAR ENDS OF BARS OF MATERIAL

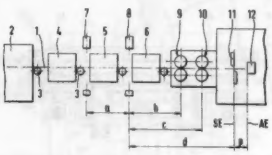
Rene Gschwend, Reinach, Switzerland, assignor to Hatebur Umformmaschinen, Reinach, Switzerland

Filed Sep. 17, 1980, Ser. No. 187,886

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940375

Int. Cl.³ B23D *15/00;* **B26D** *5/32*

U.S. Cl. 83—27 **7 Claims**



1. A method of automatically discarding the front and rear ends of bars of material of finite length initially continuously moving, the bars of material along a straight-line conveyor track and then feeding, by intermittent forward pushing against an end-stop, to a shearing blade, in whose vicinity at least the front end and the rear end of each bar of material is discarded, connecting at least one sensing device provided in the region of the conveyor track of the bars of material to a counter and delivering a control pulse to the counter whenever the interface between two successive bars of material passes, wherein the distance (a) between two sensing devices located in the region of the conveyor track, and at least the distances (b, d) of one sensing device from a pair of feed rollers and from the shearing plane or the plane of the end-stop, are stored in a microprocessor and recording the time interval during which an end of a bar traverses the track distance (a) between the two sensing devices, re-expressing the remaining distances (b, d) in terms of time intervals, and discarding one or, at the most, two section lengths for each interface between successive bars, depending on whether the interface between bars is located in the central region of the section length in question, or in one of the two end regions, discarding being effected in the vicinity of the shearing device, by reference to the control data stored and computed in the microprocessor.

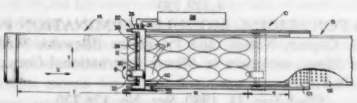
4,328,726
APPARATUS AND METHOD FOR WORKING ON SUCCESSIVE SEGMENTS OF SHEET MATERIAL

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Continuation of Ser. No. 8,045, Jan. 31, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 207,873

Int. Cl.³ B26D *7/06;* **B65H** *35/00*

U.S. Cl. 83—39 **35 Claims**



1. In an apparatus for working on sheet material and having a working table, instrument means for working on sheet material, carriage means supported to move in a first coordinate direction relative to the table for moving the instrument means in working relation to sheet material spread on the table, first drive means for moving the carriage means in the first coordinate direction, means for controlling said first drive means to control movement of said carriage means, material shifting means for moving the sheet material relative to the table and in the first coordinate direction, and second drive means for moving the material shifting means, the apparatus having a working mode wherein said carriage means moves in said first coordinate direction from a position of origin relative to the table and the material spread thereon in response to signals from the control means to move the instrument in working relation to the material and a material moving mode wherein the instrument is out of working relation to the sheet material and the material shifting means moves the sheet material in the first coordinate direction relative to the table, the improvement comprising a rotary encoder coupled to said carriage means and to said material shifting means for detecting movement of said carriage means in said first coordinate direction relative to said material shifting means in returning toward said position of origin upon completion of said working mode and responsive means connecting said rotary encoder to said second drive means for energizing said second drive means in response to the detected movement of said carriage means relative to the material shifting means to cause said material shifting means to move in said first coordinate direction and to a predetermined position.

4,328,727
SLITTER-SCORER APPARATUS

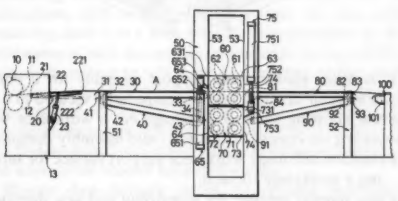
Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Apr. 28, 1980, Ser. No. 144,309

Claims priority, application Japan, May 9, 1979, 54-57378; Mar. 19, 1980, 55-34954

Int. Cl.³ B26D *3/08, 11/00*

U.S. Cl. 83—106 **14 Claims**



1. A slitter-scorer apparatus which can immediately change longitudinal slitting and scoring operations along the flowing direction of continuously fed long and flat materials thereby to perform the slitting and scoring operations without reducing the flowing speed thereof and deliver the materials to a following process, characterized in that said slitter-scorer apparatus comprises a cutting machine for instantly cutting off the materials transversely; a movable deflector disposed at the exit of said cutting machine to guide said materials to an upward position or a downward position; a machine frame disposed behind said deflector; an upper slitter-scorer unit and a lower slitter-scorer unit disposed in one above the other relationship on said machine frame, said slitter-scorer units being so mounted on said frame as to be capable of ascending and descending respectively between an operating position and a stand-by position on said machine frame, the operating position of said upper slitter-scorer unit occupying approximately the same location as the operating position of said lower slitter-scorer unit; an upper front guide plate adapted to guide said materials from the upward position of said deflector to the entrance of said upper slitter-scorer unit; an upper rear guide plate adapted to guide said materials from the exit of said upper slitter-scorer unit to the entrance of the following process; a lower front guide plate adapted to guide said materials from the downward position of said deflector to the entrance of said lower slitter-scorer unit; a lower rear guide plate adapted to guide said materials from the exit of said lower slitter-scorer unit to the entrance of the following process; said upper guide plates being mounted for movement to align with said upper slitter-scorer unit when it is in its operative position and said

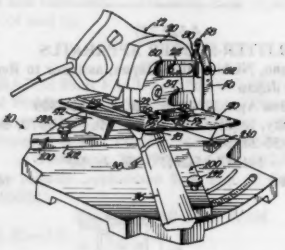
lower guide plates being mounted for movement to align with said lower slitter-scorer unit when it is in its operative position; whereby said upper and lower slitter-scorer units may be caused to ascend or descend during the performance of order changes; and said longitudinal slitting and scoring operations may be performed on the materials which are delivered along an approximately straight line from said cutting machine to the following process through one or the other of said upper and lower slitter-scorer units.

4,328,728

APPARATUS FOR EFFECTING A MITER CUT WITH A PORTABLE CIRCULAR SAW

Irwin J. Ferdinand, Glencoe; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Apr. 29, 1980, Ser. No. 141,072
Int. Cl.[3] B27B *5/20, 9/04*
U.S. Cl. 83—471.3 2 Claims



1. A miter platform and support assembly for a portable power circular saw that may be temporarily secured in a fixed position allowing the user to plunge cut a workpiece with a downward movement of said saw, said assembly comprising:

a platform defining a workpiece support surface for supporting a workpiece thereon;

a saw support member for supporting said saw thereon;

means for releasably securing said saw to said saw support member;

means for pivotably mounting said saw support member to said platform about a substantially horizontal axis to permit movement of said saw support member between a fully lowered position generally spaced from and parallel to said platform and a raised position tilted above said platform to allow placement, positioning, and removal of the workpiece;

two independently movable fences pivotally connected at a substantially vertical pivot axis to said platform and movable to various angular positions across and relative to said platform for aligning the workpiece;

first and second arcuate guide slots associated with each said fence and defined in said platform in arcs concentric about said fence vertical pivot axis;

first and second guide members spaced apart along each said fence and projecting therefrom into said first and second arcuate guide slots, respectively, for guiding the movement of the associated fence at spaced locations along its length;

means for releasably restraining each said fence from pivotable movement relative to said platform;

a vertically extending support bracket mounted to said platform, said bracket defining a plurality of vertically spaced holes above the elevation of said workpiece support surface; and

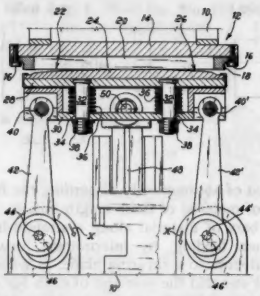
an arm defining a saw blade guard operating lever engaging slot for receiving an operating lever of the blade guard on a saw; and means for pivotally mounting said arm to said bracket through one of said vertically spaced holes about an axis fixed relative to said platform.

4,328,729

PLANE DIE-CUTTING MACHINE

Angelo Bartesaghi, Coduti a Fossoli 22, Lecco (Como), Italy

Filed May 5, 1980, Ser. No. 146,619
Claims priority, application Italy, May 14, 1979, 22655 A/79
Int. Cl.[3] B26F *1/00*
U.S. Cl. 83—568 7 Claims



1. A die-cutting maching for die-cutting laminar material, comprising a first punch member having an external surface which is provided with cutting means for die-cutting, said cutting means having a substantially linear profile; a second punch member having an external surface which has a substantially arcuate profile; moving means for reciprocally moving said second punch member relative to said first punch member between a first position in which said first and second punch members are spaced apart to permit the introduction therebetween of a sheet of material to be die-cut and a second position in which said first and second punch members engage each other to die-cut sheet material inserted therebetween and for rocking said second punch member relative to said first punch member such that said external surface of said second punch member rolls on said external surface of said first punch member when said first and second punch members are in said second position, whereby said first and second punch members cooperate to progressively cut sheet material inserted therebetween; and mounting means for mounting said second punch member on said moving means, said mounting means including a frame attached to said moving means and urging means interposed between said frame and said second punch member for resiliently urging said second punch member away from said frame and towards said first punch member.

4,328,730

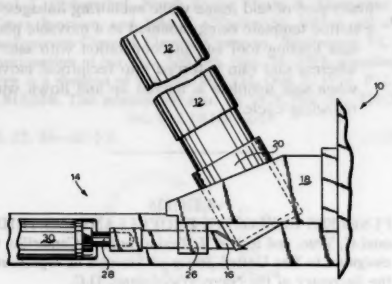
MEANS FOR SLICING MODULE TERMINATION PLUG

Myron J. Coplan, Natick, and Friedhelm Bilewski, Medway, both of Mass., assignors to Albany International Corp., Menands, N.Y.

Filed Aug. 11, 1980, Ser. No. 176,720
Int. Cl.[3] B26D *3/14, 5/12, 7/01*
U.S. Cl. 83—581 2 Claims

1. A slicing device for slicing through a plug of potting compound including in combination a housing assembly for supporting said plug, a cutting blade, a cutting position of said blade, means for moving said blade into and out of said cutting position, said cutting blade being in the configuration of an inverse plow, said blade having two sides which project a V resulting at the cutting zone of said blade in two separate sub-blades each of which has a uniform side reflex angle and two distinct sections of different side rake angles and in which

each of said sub-blades has a cutting edge depressed from the horizontal at an angle of thirty degrees with one rake angle



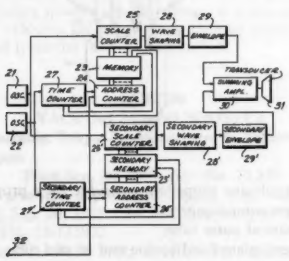
being of five degrees and the remaining rake angle of fifteen degrees.

4,328,731

ELECTRONIC TONE GENERATOR

Mitsuhiro Gotho; Masayuki Ikeda; Hidetoshi Komatsu, and Takahiro Naka, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,508
Claims priority, application Japan, Jul. 15, 1977, 52-85415
Int. Cl.³ G10H *1/057, 1/12, 7/00*
U.S. Cl. 84—1.01 **26 Claims**



1. An electronic tone generator for automatically reproducing musical melodies using stored data, comprising:

at least one signal generating oscillating circuit;

a memory circuit for storing data for controlling note duration;

at least one note producing circuit;

circuit means for controlling the duration of each individual note produced by said at least one note producing circuit, said circuit means for controlling duration operating in response to said data stored in said memory circuit, said circuit means for controlling note duration including a programmable counter dividing down signals from said at least one signal-generating oscillator circuit, the division ratio of said programmable counter being variable in response to said data stored in said memory;

an address counter receiving the output of said programmable counter and outputting a signal to said memory circuit, said signal causing the memory address to advance, whereby data for the next successive note is input to said programmable counter from said memory;

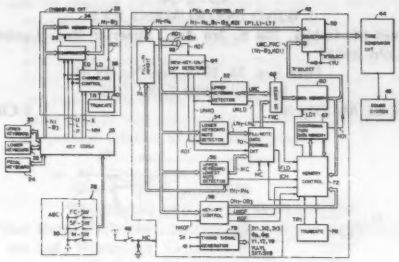
and an electro acoustic transducer receiving the output of said at least one note producing circuit and outputting audible notes to reproduce music.

4,328,732

ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF FILL-NOTE GENERATION

Toshio Takeda; Takehisa Amano; Sigeki Isli, and Seiya Hamada, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 3, 1980, Ser. No. 193,605
Claims priority, application Japan, Oct. 9, 1979, 54-130254
Int. Cl.³ G10H *1/36, 5/00*
U.S. Cl. 84—1.17 **20 Claims**



1. An electronic musical instrument comprising:

(a) first and second keyboard means respectively including keys corresponding to musical notes;

(b) key data generating means responsive to the depressing of the keys on the first and second keyboard means for generating key data indentifying the individual keys in accordance with a prescribed key code, the key code resolving itself into a note code for representation of the note name of each key and an octave code for representation of the octave to which the key belongs, so that each set of key-coded key data, representative of a single key, is composed of note-coded data and octave-coded data, the key data comprising first key data indicative of the keys of the first keyboard means and second key data indicative of the keys of the second keyboard means;

(c) fill-note data forming means for creating key-coded fill-note data by combining octave-coded data which are in predetermined octaval relation with the octave-coded data included in the first key data, with the note-coded data included in the second key data; and

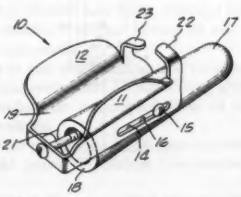
(d) tone generator means for generating fill tones in response to the key-coded fill-note data.

4,328,733

SLIDE BAR HOLDER DEVICE FOR HAWAIIAN GUITAR

Walter E. Smith, P.O. Box 707, Weiser, Id. 83672

Filed Mar. 16, 1981, Ser. No. 243,995
Int. Cl.³ G10D *3/16*
U.S. Cl. 84—319 **6 Claims**



1. A slide bar device for use on the strings of a guitar, or the like, comprising: a hollow bar having an outer surface for contact with the strings, a core adjustably mounted to move axially within said hollow bar, and having a portion projecting from the rearward end of said bar, a pair of spaced wing mem-

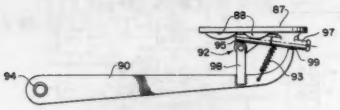
bers adjustably secured to said bar, said wing members defining a recess for the index finger of the user, one of said wing members being adapted for contact with the thumb of the user and the other of said wing members being adapted for contact with the middle finger of the user, at least one of said wing members being sufficiently flexible to enable the user to grip the index finger between said wing members by applying lateral pressure between the thumb and the middle finger.

4,328,734

WIND INSTRUMENT KEY

James M. Gebler, 204 S. 3rd Ave., Superior Rte., Louisville, Colo. 80027

Filed Sep. 28, 1979, Ser. No. 79,849
Int. Cl.³ G10D *7/00, 7/08*
U.S. Cl. 84—380 R **8 Claims**



1. In a wind instrument cluster assembly mounted on an instrument body, a cluster key assembly having a plurality of tone hole covers mounted on the instrument body for movement relative to adjacent tone holes, and a plurality of linkage means each operably connected to each tone hole cover to selectively move such tone hole cover in response to actuation of the associated linkage means by the cluster key assembly, the improvement comprising:

a rigid plate member mounted on said instrument body adjacent the linkage means by universal joint means; and

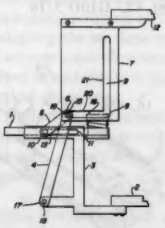
a plurality of contact points defined on the rigid plate at positions around the universal joint means, each of the contact points being adjacent and operably associated with at least one of the linkage means, whereby movement of the plate member around the universal joint means will engage at least one of the plate member contact points with at least one of the linkage means to selectively actuate the plurality of tone hole covers with a single rigid plate.

4,328,735

PROGRESSIVE SHOTSHELL RELOADING

Johnnie D. Allen, 105 Bayou Vista Dr., Hitchcock, Tex. 77563

Filed Jan. 31, 1979, Ser. No. 8,169
Int. Cl.³ F42B *33/00*
U.S. Cl. 86—36 **4 Claims**



1. An automatic primer carrying device facilitated of a mountable frame encasing a slidable ram, said ram being capable of accepting primers from a feeder tube into a provided cavity of said ram while carrying said primers to a primer seating device;

said slidable ram being mechanically actuated through a slot provided of said frame by a swivel connected end of a short linkage whose other end of said linkage is swivelably connected to a longer linkage where a roller is provided; other end of said linkage is also swivelably connected to a lower part of said frame while anchoring linkages;

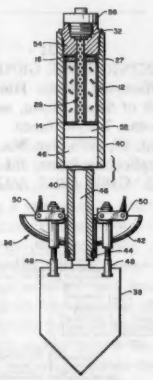
a slotted template being mounted to a movable platen of said loading tool and in cooperation with said roller wherein said ram is forced into reciprocal movement when said template is moved up and down with the reloading cycle.

4,328,736

FUSELESS EXPLOSIVE PROPELLANT CARTRIDGE

Daniel G. True, and Robert J. Taylor, both of Camarillo, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1980, Ser. No. 155,719
Int. Cl.³ F41D *11/06;* **F42B** *5/20*
U.S. Cl. 89—17 **8 Claims**



1. An explosive propellant cartridge for a propellant-actuation device comprising:

a cylindrical outer tube;

a first end plate fixed to one end of said tube, said first end plate having a central aperture;

a second end plate fixed to the other end of said tube, said second end plate having a central aperture;

a perforated inner tube fixed to said first end plate, said inner tube being concentric with said outer tube and extending between the central aperture in said first end plate and the central aperture in said second end plate, an annular chamber being formed by said outer tube, said inner tube, said first end plate, and said second end plate; and a propellant disposed in said annular chamber;

said first end plate being securely fixed to said outer tube and said second end plate being removably fixed to said outer tube to allow the amount of said propellant in said annular chamber to be easily adjusted to provide flexibility in the amount of charge therein for meeting variable field conditions;

said perforated inner tube having a high void ratio, and being adapted for readily receiving an elongated fusing element and operable for being readily reseparated from said elongated fuzing element, remotely, in case of system malfunction, permitting fuzing and defusing of the propellant in said annular chamber, whereby said propellant cartridge can be disarmed after deployment in the propellant actuated device while greatly reducing disarming hazard.

4,328,737

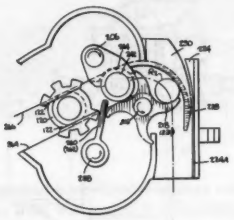
AMMUNITION FEEDER FOR A GUN

Lawrence Nelson, Williston; Victor R. Gardy, Shelburne; August J. Habersthol, North Hero; Eltore J. Manucuso, Jr., Essex Junction, and John F. O'Brien, St. Albans, all of Vt., assignors to General Electric Company, Burlington, Vt.

Continuation of Ser. No. 533,189, Dec. 16, 1974, abandoned, which is a division of Ser. No. 403,121, Oct. 3, 1973, Pat. No. 3,915,058. This application Jun. 12, 1978, Ser. No. 924,783

Int. Cl.[3] F41D *10/06*

U.S. Cl. 89—33 CA 5 Claims



1. An ammunition feeder for a gun having a longitudinally reciprocating gun bolt, including:

first rotating sprocket means, driven at a substantially uniform rotational velocity, for advancing a train of rounds of ammunition at a substantially uniform linear velocity;

second rotating sprocket means, driven at a non-uniform rotational velocity, for receiving a round of ammunition from said first sprocket means for transversely translating each round to the face of the gun bolt of the gun; and

third rotating sprocket means, driven at a non-uniform rotational velocity, for transversely ejecting a previously fired around from the face of the gun bolt.

4,328,738

VACUUM SERVO BOOSTER

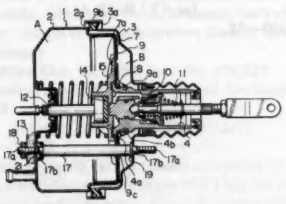
Seiji Hamamatsu, Tokyo, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Sep. 20, 1979, Ser. No. 77,370

Claims priority, application Japan, Sep. 20, 1978, 53-128822[U]; Sep. 20, 1978, 53-128825; Sep. 29, 1978, 53-133801; Sep. 29, 1978, 53-133802

Int. Cl.[3] F15B *9/10*; F01B *19/00*; F16J *3/02*

U.S. Cl. 91—376 R 1 Claim



1. A vacuum servo booster device comprising:

a housing having a front and rear shell;

a valve body slidably supported by said rear shell and having a valve mechanism therein;

a flexible diaphragm connected to a circumferential surface of said valve body and radially extending to and connected to a circumferential surface of said housing, said diaphragm dividing the interior space of said housing into a front and rear chamber;

a piston plate mounted around said valve body and extending contiguously with said diaphragm, said piston plate having one side abutting said diaphragm, said said piston plate having a bore therethrough;

at least one rigid connecting rod extending through the front and rear chambers and slidably extending through said bore, the opposite ends of said rod respectively connected to the front and rear shells;

said diaphragm having an integral lip portion extending radially inwardly from the peripheral surface of said bore for sealingly and slidably engaging said connecting rod; and

said lip portion having an integral retaining portion, said retaining portion including an integral sleeve and an integral flange, said sleeve axially extending from said one side of said piston plate and through said bore and to the other side of said piston plate, said integral flange extending radially outwardly from said sleeve and abutting the other side of said piston plate for fixedly positioning said lip portion relative to said piston plate.

4,328,739

HYDROSTATIC PISTON MACHINE

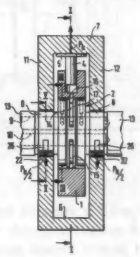
Peter Rutz, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jan. 29, 1980, Ser. No. 116,491

Claims priority, application Switzerland, Feb. 26, 1979, 1860/79

Int. Cl.[3] F01B *13/06*

U.S. Cl. 91—484 3 Claims



1. A hydrostatic piston machine comprising

a pintle having an axis;

a cylinder block rotatably mounted on said pintle;

a plurality of peripherally distributed pistons slidably mounted in said cylinder block radially relative to said pintle, each said piston having a support surface at an outer end thereof;

an annular guide member having a pair of side walls rotatably mounted on said pintle about an axis eccentric to said longitudinal axis and a plurality of plane guide surfaces, each said guide surface having a respective piston support surface guided thereon and being disposed tangentially of a circular cylindrical surface having an axis eccentric to said axis of said pintle;

a pair of ports in said pintle facing said cylinder block;

a first bore in said pintle and communicating with one of said ports to conduct an unthrottled flow of high-pressure hydraulic medium;

a second bore in said pintle and communicating with the other of said ports to conduct low-pressure hydraulic medium;

a pair of hydrostatic bearing pockets in said pintle facing said cylinder block on opposite sides of said one port;

a pair of throttles, each said throttle connecting a respective pocket with said first bore for throttling a flow of high-pressure medium;

a second pair of hydrostatic bearing pockets in said pintle, each said pocket of said second pair facing a respective

side wall on an opposite side of said pintle from said one port;

a second pair of throttles, each said throttle of said second pair connecting a pocket of said second piar of pockets to said first bore for throttling a flow of high-pressure medium; and

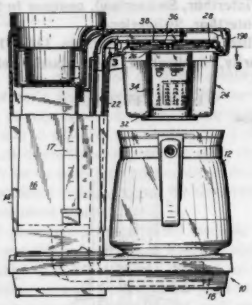
a third pair of bearing pockets in said pintle, each said pocket of said third pair facing a respective side wall on said opposite side and communicating with said first bore to receive an unthrottled flow of high-pressure medium.

4,328,740

COFFEE MAKER WITH A VARIABLE BREW STRENGTH APPARATUS

Robert M. McDonough, Hatfield; Thomas E. Hanson, Phoenixville; Richard H. Brill, Philadelphia, and Ronald W. Oates, Chalfont, all of Pa., assignors to SCM Corporation, New York, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,408
Int. Cl.³ A47J *31/10*
U.S. Cl. 99—295 **14 Claims**



1. A coffeemaker with a variable brew strength apparatus comprising a base, a water reservoir mounted in said base, electrically operated heater means mounted in said base and disposed to heat water stored in said reservoir, tubing means connecting said water reservoir and said heater means, coffee carafe means mounted on said base, basket means mounted on said base and disposed to accept heated water from said tubing means and to discharge brewed coffee into said coffee carafe, inner basket means mounted in said basket means for holding coffee grounds, valve means mounted on said basket means capable to directing a measured portion of said water into said inner basket means for brewing coffee and directing a measured portion of said water directly into said basket means, bypassing said inner basket, for diluting the coffee brewed in said inner basket means and coffee scoop means removably mounted on said basket means for introducing measured quantities of coffee into said inner basket means.

4,328,741

APPARATUS FOR PRODUCING CRACKERS

Hayashi Yoshikazu, Okazaki, Japan, assignor to Kabushiki Kaisha Airin, Okazaki, Japan

Filed May 22, 1980, Ser. No. 152,144
Claims priority, application Japan, Jun. 6, 1979, 54-70995
Int. Cl.³ A47J *27/62*
U.S. Cl. 99—332 **2 Claims**

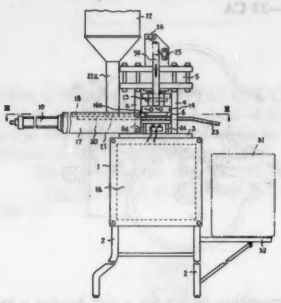
2. An apparatus for producing a cracker from a raw material such as rice or the like, comprising:

a lower baking mold having a bottom plate which is adapted to be heated and moved upwardly;

a first heater for heating said bottom plate;

an upper baking mold for selectively moving upwardly or downwardly relative to said lower baking mold in a fluid-tight manner, said upper baking mold also suited for heating by a second heater;

control means for compressing and heating for a predetermined time said raw material contained within a hermetically closed chamber defined in said upper and lower baking molds, expanding instantaneously said compressed and heated raw material by opening said baking molds and concurrently discharging steam produced within said



chamber during said expanded material by means of said baking molds; and

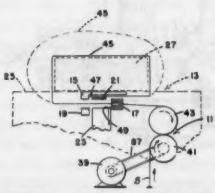
a slidable feeding plate for transporting a predetermined quantity of said raw material as supplied from a supply source, said feeding plate suited both for pushing outwardly a shaped and self-sustaining cracker from said lower baking mold and for feeding said predetermined quantity of raw material into said lower mold when said upper baking mold is at a lifted position.

4,328,742

STRAPPING APPARATUS FEED AND TENSION MECHANISM

James L. Discavage, Essington, Pa., assignor to Cyklop Strapping Corp., Downingtown, Pa.

Filed Feb. 25, 1980, Ser. No. 124,027
Int. Cl.³ B65B *13/22*
U.S. Cl. 100—32 **15 Claims**



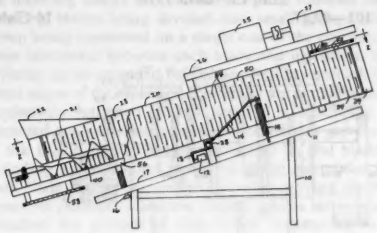
1. In a strapping apparatus, a strap feed and tension mechanism including a pair of rolls having peripheral surfaces of substantially like diameter for engaging with opposite sides of a strap, a pair of meshing gears fixed to each of said rolls as flanges on opposite sides thereof, and drive means for rotating one of said rolls, said meshing gears serving as strap guides and also causing said pair of rolls to rotate at substantially the same speed during strap feeding and tensioning to thereby avoid abrasion of the strap.

4,328,743

HONEYCOMB CAPPINGS COMPRESSOR

Orville C. Fager, 1220 Grignon St., Green Bay, Wis. 54301

Filed Mar. 25, 1980, Ser. No. 134,141
Int. Cl.[3] B30B *5/06*
U.S. Cl. 100—49 1 Claim



1. An improved honeycomb cappings compressor for separating honey from wax cappings comprising:

a. a trough assembly comprising two side-by-side, endless vertically disposed conveyors converging towards each other for progressively compressing said cappings therebetween from an inlet end to a discharge end thereof, said trough assembly including a trough bottom disposed between said conveyor, said trough bottom being fixed with respect to said conveyors,

b. means mounted within the inlet end of said trough assembly for driving said cappings in longitudinal progression from said inlet and toward said converging conveyors,

c. said trough assembly being pivotally canted about a point located at approximately the mid-point thereof,

d. automatically controlled means for stopping the operation of said compressor when empty, said stopping means comprising a switch operatively associated with said canted means and triggered by imbalance of said canted means,

e. inwardly directed louver means impressed in each of said conveyors for dragging said cappings along said trough bottom while continuing compression, and

f. openings formed in each of said conveyors by said inwardly directed louver means for allowing the honey to be extruded therethrough during compression.

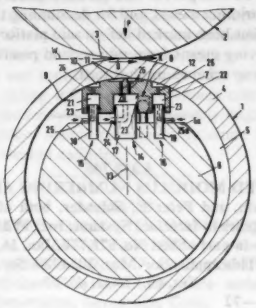
4,328,744

ROLL FOR USE IN CALENDERS OR THE LIKE

Josef Pav, Krefeld, and Dieter Junk, Kreuztal, both of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 196,123
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2942002
Int. Cl.[3] B30B *3/04;* B21B *13/02*
U.S. Cl. 100—162 B 32 Claims

1. A pressure applying roll for use in calenders or the like to define with a parallel complementary roll a nip for the passage of webs of paper, textile or other material, comprising a hollow cylindrical rotary shell having an internal surface; a stationary carrier extending through and spacedly surrounded by said shell; bearing means including at least one bearing element interposed between said carrier and said shell and having a second surface complementary to and adjacent to said internal surface; a plurality of fluid-operated pressure generating devices including first and second devices, said devices being operable to urge said second surface against said internal surface and said first and second devices being spaced apart from each other, as considered in the circumferential direction of said shell; and means for operating said devices including means for supplying to each of said devices pressurized fluid at a selected pressure, said operating means including means for supplying fluid to said first device at at least one first pressure



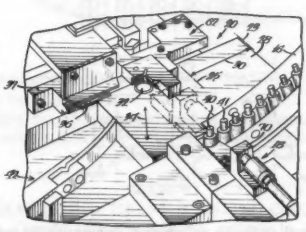
and means for supplying fluid to said second device at at least one second pressure which is different from said first pressure.

4,328,745

QUICK ACTING AUTOMATIC MARKING MACHINE

Roy L. Trimble, Theodosia, Mo., assignor to Signode Corporation, Glenview, Ill.

Filed May 23, 1980, Ser. No. 152,661
Int. Cl.[3] B41F *17/08*
U.S. Cl. 101—7 13 Claims



1. Apparatus for marking parts, supplied serially thereto, comprising:

(a) a frame;

(b) a platform;

(c) supporting means for slidably supporting said platform on said frame whereby said platform is free to move reciprocatingly in a plane between a first position and a second position;

(d) means, carried by said frame in a fixed position relative to said platform, for imprinting one or more characters on a part;

(e) driving means, carried by said frame, for driving said platform reciprocatingly and continuously in a cycle between said first and said second positions including a slotted link pivotally joined at one end to said frame and coupled at the other end to said platform, a roller crank, the roller end of said crank rotatably fitting within the slot in said link, and rotating means, carried by said frame, for rotating said roller crank at a generally uniform angular velocity, whereby said platform reciprocates between said first position and said second position in a continuous cycle, the relative speed of said platform from said first position to said second position being slower than the relative speed of said platform from said second position to said first position; and

(f) means carried by said platform and operatively associated with said driving means for rotatably coupling said part to said platform, for holding said coupled part pressed

against said imprinting means while said platform is driven from said first position to said second position whereby the characters on said imprinting means are serially impressed on said part as said part is rotatably drawn across said imprinting means, and for decoupling the marked part after it has been marked before said platform is moved by said driving means from said second position to said first position to receive another part.

4,328,746

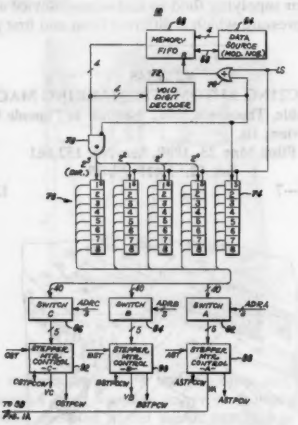
WEIGHTED MODULUS NUMBERING APPARATUS

Ira Eglowstein, and Peter E. Solender, both of Williamsville, N.Y., assignors to Interface Systems, Inc., Williamsville, N.Y.

Continuation-in-part of Ser. No. 871,778, Jan. 24, 1978, Pat. No. 4,202,265. This application Mar. 20, 1980, Ser. No. 131,876

Int. Cl.³ B41L *45/00*

U.S. Cl. 101—72 **7 Claims**



1. Weighted modulus numbering apparatus for printing a check digit with an identification number in successive printing cycles using a weighted modulus system which produces invalid check digits for certain of said identification digits, said apparatus comprising identification number printing means and check digit printing means for presenting a composite number for printing, means operative to increment said identification number printing means to selectively present the first or the second successive identification numbers for printing during each printing cycle, means for generating successive words according to said weighted modulus system representing check digits associated with said successive identification number, including said invalid check digits, means responsive to said identification numbers for providing digital signals representing the validity or invalidity of the check digits therefor, means for storing said successive check digit words with the digital signals representing the validity and invalidity thereof, each said printing cycle, and for storing the next successive one of said check digit words with said digital signal when said digital signal represents an invalid check digit word, first control means for said identification number incrementing means for causing it to increment to said second successive identification number when said digital signal represents said invalid check digits and to said first successive first identification number when said digital signal represents said valid check digits, and second control means for operating said check digit printing means in response to said check digit word in said storing means.

4,328,747

CHARACTER RING-SELECTING TYPE PRINTER

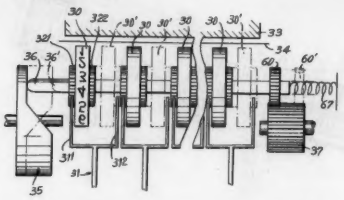
Hitoshi Fujiwara, and Yousei Kawabata, both of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Nagano, both of, Japan

Filed Mar. 19, 1980, Ser. No. 131,561

Claims priority, application Japan, Mar. 23, 1979, 54-37562

Int. Cl.³ B41J *1/16*

U.S. Cl. 101—93.17 **14 Claims**



1. In a character ring-selecting type printer including a plurality of character rings mounted for rotation about a common axis, each of said character rings having characters on the periphery thereof for printing on the surface of a printing medium; means for rotationally driving said character rings; means for stopping said rotational driving of said character rings individually at selected positions; pressing means for pressing on said character rings for printing after said selection and cessation of said rotational driving, the improvement therein comprising:

lateral spacing between said character rings;

means for translating at least two of said plurality of character rings in unison, said translation being in the direction of said lateral spacing parallel to said common rotational axis of said character rings;

means for selectively and individually actuating said individual stopping means, said stopping means and said associated actuating means being moved laterally in unison with said associated character ring by said translating means,

whereby a process of character selection and printing is performable at at least two lateral positions of said at least two character rings and the number of printable columns exceeds the number of said character rings.

4,328,748

ARRANGEMENT FOR METERING INK ON THE FOUNTAIN ROLLER OF A PRINTING PRESS

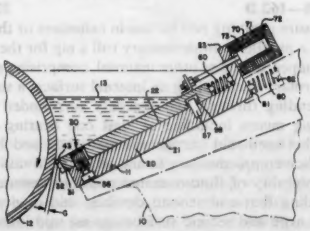
Peter Schramm, Berliner Platz, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 219,042, Dec. 22, 1980, abandoned. This application Jan. 22, 1981, Ser. No. 228,877

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951653

Int. Cl.³ B41F *31/04, 31/06*

U.S. Cl. 101—365 **6 Claims**



1. An ink fountain comprising, in combination, a frame, a fountain roller journaled with respect to the frame and extend-

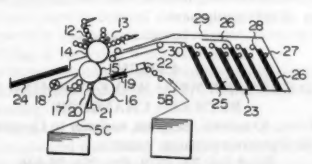
ing the length thereof, drive means for slowly rotating the fountain roller, a plurality of carriers arranged side-by-side on the frame movable perpendicularly to the roller to define a blade-supporting surface, a plurality of metering blades on the blade-supporting surface arranged closely side-by-side to define zonal positions, each of the blades having a metering edge which is presented to the fountain roller, a body of ink above the metering blades and contained by the fountain roller, the metering blades being divided into small groups with each group being supported on a single one of the carriers, a set of stops interposed between each blade and its carrier, the stops defining (a) an extended reference position in which the presented edges of the blades on the carrier are in alignment and (b) a relatively retracted feeding position in which the blade is retracted a predetermined amount to define a gap for feeding of ink in the zonal position controlled by the blade, means including an individual power actuator interposed between each blade and its carrier for forceably moving the blade between its alternate positions, control means for activating the actuators for periods of time which correspond to the ink requirements of the zonal position, the control means including provision for ensuring that at least one of the actuators in each group is operated in sequence with the companion actuators so that at all times at least one of the metering blades in each group occupies its extended reference position, and biasing means interposed between the frame of the fountain and each carrier for urging the carrier in the direction of the fountain roller thereby to keep the extended blade on each carrier in contact with the fountain roller to act as a local gauging device for the retracted ones of the blades in the group.

4,328,749

INFORMATION RECORDING METHOD AND APPARATUS, AND A HALF-PRODUCT OBTAINED THEREBY

Yoshinori Inouye, Kyoto; Akio Ando, Otsu, and Ryuichi Nakahashi, Tokyo, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 22, 1979, Ser. No. 87,192
Claims priority, application Japan, Oct. 26, 1978, 53-131794
Int. Cl.³ B41F *19/00*
U.S. Cl. 101—426 **7 Claims**



1. A method for ink-printing at least one steady information onto a continuous paper which has a series of perforations or sprocket holes on both sides along the length of said paper for controlling the feed of said paper which has at least one prerecorded variant information and at least one prerecorded identification information for identifying the steady information to be ink-printed with a predetermined positional relationship to the steady information, comprising:

(a) feeding said continuous paper to an ink printing station by pin feed tractor means;

(b) reading the recorded identification information to select a desired steady information corresponding thereto from a plurality of pieces of steady information;

(c) storing steady information at a storage location separate from said ink printing station by means of a storage receptacle adapted to hold a plurality of printing plates having different steady information and storing members for separately storing the different printing plates;

(d) selecting steady information by means of printing plate feeding members constructed and arranged for selecting and taking out a printing plate corresponding to the read identification information from the storing members;

(e) feeding said printing plate from the storage location to said ink printing station;

(f) attaching the selected printing plate onto a plate cylinder;

(g) reading prerecorded identification information for identification of the correct color printing ink;

(h) selecting and applying the correct color printing ink;

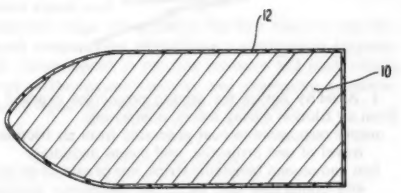
(i) printing steady information by means comprising said blanket cylinder which is disengageably engaged by said plate cylinders which disengageably come into contact with said blanket cylinder.

4,328,750

PLASTIC COATED AMMUNITION AND METHODS OF MANUFACTURE

James L. Oberg, Suffield; Roger J. Curran, Stratford, both of Conn., and Michael Czayka, Warren, Ohio, assignors to Bangor Punta Corporation, Greenwich, Conn.

Filed Oct. 26, 1978, Ser. No. 955,072
Int. Cl.³ F42B *5/00, 11/04*
U.S. Cl. 102—514 **24 Claims**



1. Ammunition comprising:

a lead bullet; and

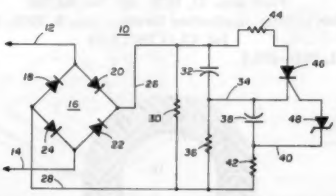
a coating on said bullet, said coating including a thermoplastic composition of molybdenum disulfide and nylon 11.

4,328,751

ELECTRONIC DELAY BLASTING CIRCUIT

Gerald L. Oswald, New Ringgold, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed May 5, 1980, Ser. No. 146,192
Int. Cl.³ F42C *11/06*
U.S. Cl. 102—220 **10 Claims**



1. A circuit for firing a resistive ignition element following a delay period, comprising:

means for full-wave rectifying an input signal to produce a D.C. signal,

means connected to receive said D.C. signal for storing an electrical charge,

means responsive to an amplitude transition of said input signal for producing a timing signal which has a changing voltage,

means for detecting when said timing signal is equal to a reference voltage, and

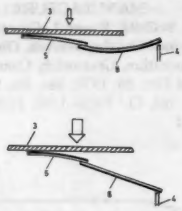
means for transferring at least a part of said electrical charge to said resistive ignition element for ignition thereof when said means for detecting detects that said timing signal is equal to said reference voltage.

4,328,752

SAFETY AND ARMING DEVICE FOR A PROJECTILE FUZE

Ulf Jander, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed May 1, 1980, Ser. No. 145,633
Claims priority, application Sweden, May 15, 1979, 7904239
Int. Cl.[3] F42C *15/00*
U.S. Cl. 102—257 3 Claims



1. A safety device for arming projectiles exposed to heat from air friction during travel, comprising:

means responsive to heat generated from air friction during travel of said projectile, said means including:

first and second bimetallic strips, one of said strips having an end contacting said projectile restricting movement of said strip in a first direction; and a second bimetallic strip having one end contacting said first metallic strip's remaining end, said strips arranged to deflect in opposite directions upon heating; and

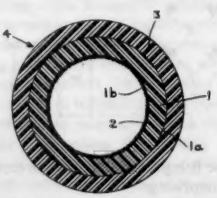
arming means for arming said projectile actuated in response to movement of said strips, said means arming said projectile as the temperature of said projectile rapidly increases as a result of said air friction forcing said strips to move.

4,328,753

LOW-ENERGY FUSE CONSISTING OF A PLASTIC TUBE THE INNER SURFACE OF WHICH IS COATED WITH EXPLOSIVE IN POWDER FORM

Leif Kristensen; Hans Lundborg, and Stig Nyqvist, all of Nora, Sweden, assignors to Nitro Nobel AB, Gyttorp, Sweden

Filed Dec. 21, 1979, Ser. No. 63,750
Claims priority, application Sweden, Aug. 8, 1978, 7808463
Int. Cl.[3] C06C *5/04*
U.S. Cl. 102—275.5 4 Claims



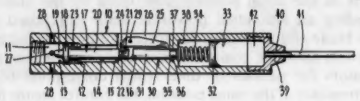
1. A low-energy fuse comprising a plastic tube having an inner surface and a coating of explosive in powder form on said inner surface, said plastic tube being of sandwich-type and comprising an outer part having relatively high resistance to external damage and an inner part having an inner adhesive surface on which said explosive is adherently applied, said inner surface having relatively high adhesion so that said explosive applied thereto is dislodged substantially only by a shock wave, said inner part having an outer surface and said outer part having an inner surface directly engaged with said outer surface of said inner part.

4,328,754

TIME DELAY DEVICE

Graeme D. Goodman, Ferntree Gully, Australia, assignor to Commonwealth of Australia, Canberra, Australia

Filed Mar. 25, 1980, Ser. No. 133,899
Claims priority, application Australia, Mar. 26, 1979, PD8199
Int. Cl.[3] F42C *9/06*
U.S. Cl. 102—277 10 Claims



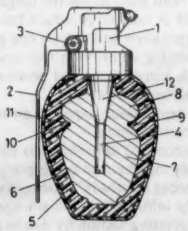
1. A time delay device adapted to be used in cooperation with a piece of equipment for which a predetermined time delay is required between an actuating action and subsequent operation thereof; said time delay device comprising a piston means cooperating, in use, with said equipment, biasing means to move said piston means between a first position in which the equipment remains in a non-operating condition and a second position in which said equipment is allowed to operate, holding means to hold said piston means in said first position, a reservoir of fluid, having a predetermined viscosity, adapted to be acted upon by said piston means, said reservoir communicating with a length of small bore tubing, whereby upon movement of said piston means fluid will be displaced from said reservoir through said tubing, with the rate of movement of said piston means, and therefore the time for said piston means to move from said first to said second position under the action of said biasing means, being dictated by the viscosity of said fluid in the reservoir and the length of said tubing, thus providing for the predetermined time delay between actuation by release of said holding means and movement of said piston means under the action of said biasing means to said second position to allow operation of said equipment.

4,328,755

HAND GRENADE WITH WAVE-FORMING MEANS BETWEEN CHAMBERS

John J. Frost, Kraainem, Belgium, assignor to Oregon Etablissement für Patentverwertung, Austria

Filed Jul. 23, 1979, Ser. No. 59,626
Claims priority, application Italy, Jul. 25, 1978, 68771 A/78
Int. Cl.[3] F42B *27/08*
U.S. Cl. 102—486 16 Claims



1. An improved hand grenade having a non-spherical elongated fragmentation body substantially surrounding an elongated interior chamber, an explosive within the interior cham-

ber, a detonator head and a detonator tube connected to the detonator head, wherein the improvement comprises the interior chamber being formed with a cross-sectional constriction intermediate the length thereof with an annular rib sub-dividing the chamber into an upper chamber and a lower chamber so as to act as a wave-forming means between said upper and lower chambers, said upper chamber being superjacently arranged above and communicating with the lower chamber, said lower chamber having a length of at least half the length of the elongated interior chamber, said lower chamber having a curved side wall which projects inwardly at its upper end to form said annular rib, and wherein the detonation tube is extended from the detonator head through the upper chamber into the lower chamber.

4,328,756

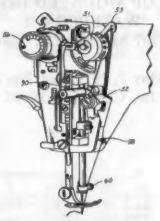
SEWING MACHINE THREAD TENSION CONTROL SYSTEM

Gene A. Boyd, 1985 Apple Ave., Muskegon, Mich. 49442

Continuation-in-part of Ser. No. 890,035, Mar. 27, 1978, abandoned. This application Jan. 7, 1980, Ser. No. 110,234

Int. Cl.³ D05B *47/02*

U.S. Cl. 112—254 **13 Claims**



1. In a needle thread tension control system for a sewing machine comprising the following elements arranged in sequence in a path of thread travel extending from a thread supply to a needle:

an infinitely variable thread tension control device;

a tortuous path thread tension control device, said tortuous path thread tension control device comprising:

(i) a generally cylindrical thread tension control post for receiving at least one wrap of thread;

(ii) said thread tension control post being disposed approximately orthogonal to the path of thread travel;

a check spring; and

a take-up arm;

said tension control post being disposed in the path of thread travel between said infinitely variable thread tension control device and said check spring to effectively multiply the tension provided by said infinitely variable thread tension control device and insulate the same from changes in pressure along the stitch line.

4,328,757

THREAD TENSION CONTROL SIGNAL OUTPUT DEVICE FOR SEWING MACHINE

Hiroshi Inaba; Kenzi Kato, and Tamotsu Nakagawa, all of Hachioji, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Aug. 11, 1980, Ser. No. 177,461

Claims priority, application Japan, Aug. 13, 1979, 54/102271

Int. Cl.³ B65H *59/40*

U.S. Cl. 112—278 **6 Claims**

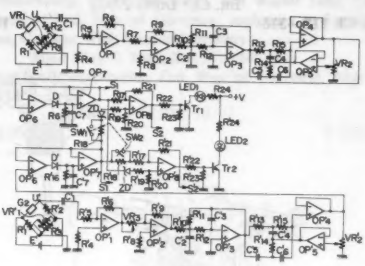
1. An electronic thread tension monitor for monitoring upper thread tension and lower thread tension, comprising:

an upper thread tension sensor responding to upper thread tension and generating an upper thread tension signal which is proportional thereto;

a lower thread tension sensor responding to lower thread tension and generating a lower thread tension signal which is proportional thereto;

a first memory connected to the upper thread tension sensor and registering peak values of the upper thread tension signal;

a second memory connected to the lower thread tension



sensor and registering peak values of the lower thread tension signal; and

a comparator stage connected to the first memory and the second memory and performing a comparison between peak values stored in the first memory and peak values stored in the second memory and generating a tension balance signal as a result of the comparison.

4,328,758

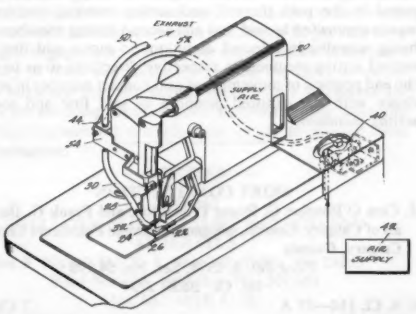
THREAD END HOLDER FOR SEWING MACHINE

Ronald Souza, Westport, Mass., and Owen F. Dunne, Tiverton, R.I., assignors to Clevepak Corporation, White Plains, N.Y.

Filed Sep. 17, 1979, Ser. No. 76,438

Int. Cl.³ D05B *65/06*

U.S. Cl. 112—286 **16 Claims**



1. An apparatus adapted for mounting on a sewing machine for holding a thread end left in the needle after completion of a sewing operation, comprising:

a tube having an opening at one end adapted to be positioned adjacent the needle of the sewing machine;

means connected to said tube for causing air flow into said opening to draw said thread end into said tube;

means operable in response to cessation of operation of the sewing machine for activating the causing means to draw said thread end into the tube; and

means for deactivating said causing means after a predetermined period of time, the thread end remaining in the tube until operation of the sewing machine is resumed.

4,328,759

SEWING MACHINE WITH A STITCH SETTING DEVICE

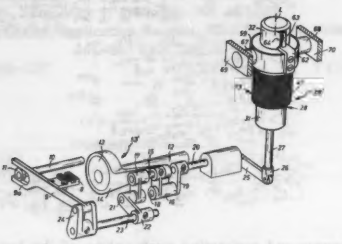
Svend Astrupgaard, Lyngby, Denmark, and Heinz Petri, Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Kaiserslautern, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,155

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916642

Int. Cl.³ D05B *27/22*

U.S. Cl. 112—316 15 Claims



1. In a sewing machine including a material engaging part engageable with a workpiece material to selectively feed the workpiece material in either forward or reverse directions in respect to a sewing needle for sewing stitches of selected length in the workpiece and a shifting mechanism for the engaging part which is adjustable for varying the amount of movement of the engaging part, the improvement comprising a stitch setting device for adjusting the length of stitch by varying the magnitude of movement of the engaging part, comprising a movable contact member connected to the shifting mechanism and being movable between two end positions to adjust the shifting mechanism by a selected amount so as to vary the amount of movement of the engaging part by a selected amount, first and second setting members disposed in the path of movement of said contacting member on respective opposite sides thereof and limiting the path of movement of the contacting member to a movement up to the engagement of the contacting member with the respective setting members disposed in the path thereof, and setting member positioning means connected to said first and second setting members and being movable in selected directions to move said first and second setting members in respective directions so as to vary the end position of movement of said contact member in accordance with the adjusted positions of said first and second setting members.

4,328,760

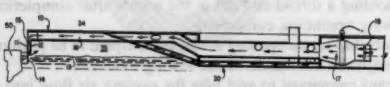
SKIRT CONSTRUCTION

J. Cam O'Rourke; G. Roger Pilkington, and Frank G. Bercha, all of Calgary, Canada, assignors to Dome Petroleum Limited, Calgary, Canada

Filed Jul. 5, 1979, Ser. No. 54,998

Int. Cl.³ B63B *1/34*

U.S. Cl. 114—67 A 7 Claims



1. A barge floating on a body of water and having a roof which extends over said body of water, said barge including skirt means depending from said roof, said skirt means comprising:

(a) a first flexible external skirt, said first flexible external skirt being provided with a metallic lip extending parallel to the longitudinal axis of said first flexible external skirt, and defining the lower edge thereof, said first flexible external skirt extending into said body of water, when said barge is floating on said body of water;

(b) a second flexible internal skirt adjacent to said first flexible external skirt, and spaced from and substantially parallel to said first flexible external skirt, said second flexible internal skirt being shorter than said first flexible external skirt, whereby said second flexible internal skirt is spaced from said body of water when said first flexible external skirt extends into said body of water and when said barge is floating on said body of water;

(c) a hot air conduit defined by a compartment formed by the space between the first flexible external skirt and said second flexible internal skirt; and

(d) A mass of hot air filling said compartment, thereby providing an enclosed heated area between said roof and said body of water when said barge is floating on said body of water, said external skirt sealing said enclosed heated area, thereby preventing the escape of said mass of hot air into said body of water.

4,328,761

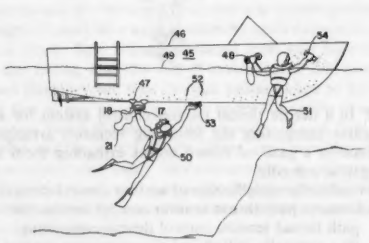
SUCTION CUP MOUNTED HOLDER FOR WATERCRAFT

William F. Dwyer, 5707 Metcalfe Ct., Shawnee Mission, Kans. 66202

Filed May 7, 1979, Ser. No. 36,860

Int. Cl.³ B63B *59/08*

U.S. Cl. 114—222 36 Claims



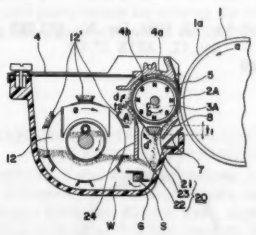
1. A hand held suction cup mounted holder which may be temporarily tightly and removably attached to a substantially smooth supporting surface and thereafter easily detached from the said supporting surface consisting essentially of a generally U-shaped member, the said U-shaped member when held whereby the U is in the inverted position consisting essentially of an elongated generally transversely extending handle portion having spaced first and second end portions from which spaced substantially parallel first and second legs respectfully extend downward at an approximately 90° angle, the said handle portion and the said first and second legs having lengths sufficient to allow the handle portion to be grasped by the hand but not greatly in excess thereof whereby the holder may be attached to a supporting surface and used effectively in a given position and moved easily from position to position on the said supporting surface, the said handle portion including means whereby it may be grasped firmly by the hand, first and second flexible and resilient suction cups mounted on the outer end portions of the first and second legs respectively by means of cooperating threaded connections therebetween, the first and second suction cups having open outer ends with air and water tight sealing surfaces and fully closed air and water tight inner ends and including continuous air and water tight flexible and resilient cup-shaped walls with generally annular transverse cross-sections, the first and second suction cups being threadedly mounted adjacent their closed inner ends so as to be in axial allignment with the longitudinal axis of the first and

second legs respectively and whereby a plane taken through the said outer end sealing surfaces thereof is substantially parallel with the longitudinal axis of the said handle portion, the first and second suction cups being constructed whereby the said walls thereof are free of non-flexible and non-resilient areas, the first and second suction cups being sufficiently flexible and resilient and having diameters and depths whereby when the holder is tightly attached to a smooth surface by means of the sealing surfaces on the open outer ends of the first and second suction cups with the longitudinal axes of the first and second legs normally being at substantially 90° with respect to the smooth surface the handle may be moved transversely back and forth through an arc of at least 45° with respect to the axis of the said handle portion without detaching the said sealing surfaces of the first and second suction cups from the smooth surface, and the holder including means whereby one end of an elongated flexible retaining means may be attached thereto for preventing loss of the holder when in use.

4,328,762
MAGNETIC BRUSH DEVELOPING APPARATUS

Kenichi Wada, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 18, 1980, Ser. No. 160,736
Claims priority, application Japan, Jul. 9, 1979, 54/87155
Int. Cl.³ G03G *15/09, 21/00*
U.S. Cl. 118—652 **12 Claims**

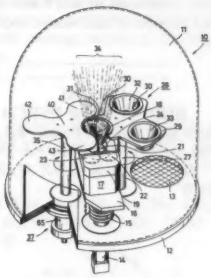


1. A magnetic brush developing apparatus which comprises:
a developing casing having a developer supply station and a developing station;
a magnetic brush carrier member in said developing casing between said developer supply station and said developing station;
a magnet roller member rotatably mounted within said magnetic brush carrier member and having means for rotating said magnet roller member in one direction for moving a developer in the form of a magnetic brush around the peripheral surface of said magnetic brush carrier member in a direction opposite to said one direction from the developer supply station to said developing station; and
a scraping member positioned along and contacting the lower portion of the peripheral surface of said magnetic brush carrier member extending in said opposite direction from said developing station, said scraping member having a scraping portion for scraping developer carried past said developing station from the magnetic brush carrier member for allowing it to fall away from said scraping member, and a guide portion extending from said scraping portion to the peripheral surface of said magnetic brush carrier member at a position spaced therealong in said opposite direction from the point at which the developer is scraped from the magnetic brush carrier member, the ends of said guide portion and said scraping portion remote from said magnetic brush carrier member being connected and being sufficiently close to said magnet roller member for allowing a flow of developer therealong which has not fallen away from said scraping member to flow back to said magnetic brush carrier member under the effect of said magnet roller member.

4,328,763
VAPORIZER FOR VACUUM DEPOSITION INSTALLATIONS

Peter Sommerkamp, Hanau am Main, and Walter Heil, Neuberg, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus, Cologne, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,632
Claims priority, application Fed. Rep. of Germany, May 3, 1979, 2917841
Int. Cl.³ C23C *13/12*
U.S. Cl. 118—727 **9 Claims**



1. In a vaporizer for vacuum deposition installations having at least one crucible and a plurality of crucible-receiving recesses, means for successively moving each recess into the same vaporizing position, vapor-conducting means for conducting vapors from the recess and shutter means for interrupting the flow of vapor from the vapor-conducting means, the improvement comprising means covering the crucible-receiving recesses not in the vaporizing position and wherein the vapor conducting means comprises a plurality of vapor screens and means for moving the screens to effect successive alignment of one screen with one recess and to effect relative vertical movement between the aligned recess and screen to provide a vapor-tight engagement, wherein the shutter means comprises a plurality of lobes and means for moving the lobes to successively align one over the aligned vapor screen and recess and means for effecting the successive alignment of the same lobe and vapor screen for a single same recess to prevent cross contamination.

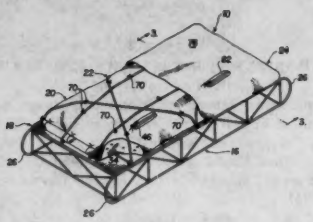
4,328,764
SHELLFISH MARICULTURE METHOD AND APPARATUS

William F. Nickel, R.F.D. 1, Box 262, Melfa, Va. 23410

Filed Nov. 19, 1980, Ser. No. 208,464
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—4 **30 Claims**

1. A shellfish mariculture apparatus for nurturing clams, oysters, scallops and the like from an infantile seed stage to commercial maturity, said apparatus comprising:
frame means operable to be positioned within an aquatic environment;
envelope means positioned upon said frame means and being generally coextensive therewith for enhousing shellfish during a nurturing period, said envelope means including a sleeve of open mesh material operable to be laid laterally upon said frame means having a lower portion supported by said frame means,
said sleeve being operably closed at the ends thereof and the interstices of said open mesh material being smaller

than the infantile shellfish to be nurtured within said envelope means; and



means operably connected to said frame means for supporting an upper portion of said sleeve above said lower portion thereof.

4,328,765

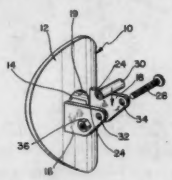
BIRD FEEDER PERCH

Peter Kilham, Mill Rd., Box 98, Foster, R.I. 02825

Filed Apr. 27, 1981, Ser. No. 257,907

Int. Cl.³ A01K *31/12, 31/00*

U.S. Cl. 119—51 R **8 Claims**



1. A perch for bird feeders and the like comprising:

a. a substantially vertical support member which is mountable on a supporting surface with an aperture extending therethrough;

b. a pair of substantially parallel spaced side walls extending outwardly in substantially vertical disposition from said support member adjacent to the periphery of said aperture on opposite sides thereof:

c. a substantially horizontal rod extending between said walls spaced outwardly from said support member; and

d. the spacing between said side walls being such as to permit smaller birds to gain access to said aperture, while preventing such access by larger birds.

4,328,766

RETRACTING COLLAR-MOUNTED LEASH

Daniel T. Deibert, P.O. Box 1553, San Marcos, Calif. 92069

Filed Mar. 9, 1981, Ser. No. 242,088

Int. Cl.³ A01K *27/00*

U.S. Cl. 119—109 **4 Claims**

1. A spring-would leash assembly to be carried on a dog collar comprising:

(a) a generally cylindrical elongated casing shaped to simulate a barrel having a longitudinal slot therein and means to attach the casing to a collar comprising a pair of spaced loops simulating barrel hoops and having bails to receive a collar;

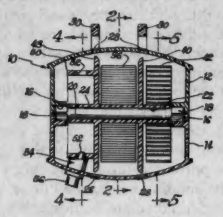
(b) a shaft mounted coaxially of said casing;

(c) a sleeve journaled on said shaft;

(d) a leaf spring engaging said sleeve at its inner end and wound in one direction therearound with the outer end engaging said casing;

(e) a flexible leash attached to said sleeve and wound around same in said one direction and extending out through said slot;

(f) detent means for alternatively locking or releasing said sleeve relative to said casing; and



(g) wherein said casing comprises a pair of longitudinally split halves together defining annular grooves and being bound together by said pair of loops simulating barrel hoops, which are snapped over said casing into said grooves such that said halves are held together by said hoops and said assembly requires no auxiliary fasteners.

4,328,767

RETRACTABLE LEASH COLLAR

Edwin R. Peterson, 415 Broadway, P.O. Box 449, Boise, Id. 83701

Filed Apr. 13, 1981, Ser. No. 252,797

Int. Cl.³ A01K *27/00*

U.S. Cl. 119—109 **10 Claims**

1. An animal collar and leash comprising a collar, a leash retractor mechanism mounted on said collar, a leash having an inner end connected with said retractor mechanism, a handle on the outer end of the leash, a guide ring for said leash on said collar approximately half way around the collar from said retractor mechanism, said guide ring forming a stop for said handle to limit the retraction of the leash by said retractor mechanism, and a stiffening member on said collar extending from said retractor mechanism to said guide ring, said stiffening member having a smooth surface to facilate the sliding of the leash thereon as the leash is extended and retracted.

4,328,768

HYDROGEN FUEL STORAGE AND DELIVERY SYSTEM

Joseph C. Tracy, Romeo, and Jan F. Herbst, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

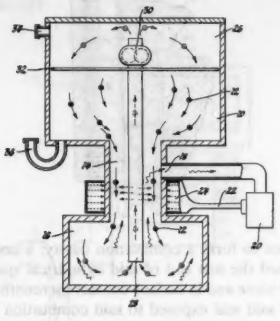
Filed Jul. 24, 1980, Ser. No. 171,753

Int. Cl.³ F02M *31/00;* **B01D** *59/10*

U.S. Cl. 123—1 A **2 Claims**

1. A hydrogen fuel storage structure for storing hollow microspheres filled with hydrogen gas and for freeing the

hydrogen gas from the microspheres for delivery to an engine, said storage structure comprising; a fuel storage chamber for enclosing a plurality of microspheres filled with hydrogen gas; heated fuel delivery chamber means for freeing the hydrogen gas from the microspheres by heating; means for delivering the microspheres to the heated fuel delivery chamber means;



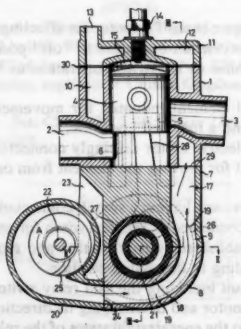
means for delivering the freed hydrogen gas to an engine; means for directing the waste heat from the engine to heat the heated fuel delivery chamber; a microsphere storage chamber for storing the microspheres after the hydrogen gas is freed therefrom; and pump means for moving the microspheres from the heated fuel delivery chamber to the microsphere storage chamber.

4,328,769

COOLING SYSTEM OF LIQUID-COOLED MULTICYLINDER ENGINE

Tetsuzo Fujikawa, Kobe; Toshiyuki Takada, Miki, and Shinichi Tamba, Kakogama, all of Hyogo, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 970,503, Dec. 18, 1978, abandoned.
This application Mar. 6, 1981, Ser. No. 241,304
Claims priority, application Japan, Dec. 26, 1977, 52-179440[U]
Int. Cl.³ F01P *5/10*
U.S. Cl. 123—41.47 **6 Claims**



1. A liquid-cooled multicylinder engine comprising

(A) at least one pair of adjacent cylinders in one portion of said engine, each cylinder having a suction conduit connected to one side thereof and an exhaust conduit connected to the other side thereof;

(B) a crank case connected to the cylinders, said crank case containing

(1) a recess in its wall,

(2) first liquid jacket means disposed on the same side of the crank case as the exhaust conduit,

(3) a crank shaft which extends axially through the crank case, and

(4) at least one bearing within said crank case substantially between said pair of cylinders for journalling said crank shaft,

(C) second liquid jacket means connected to the first liquid jackt means,

(D) a liquid pump in the recess of the crank case which is driven by said crank shaft and is connected to said first liquid jacket means by

(1) a liquid passage means for circulating cooling liquid, said liquid passage means extending from the suction side to the exhaust side of said crank case along the underside and lateral side of the portion of the crank case containing said bearing, and

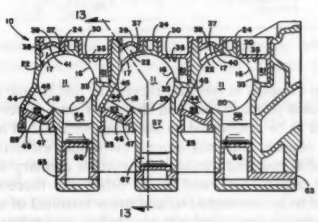
(2) said liquid pump comprising a pump outlet connected to said liquid passage means on the suction side of said crank case.

4,328,770

INTERNAL COMBUSTION ENGINE WITH DIE CASTABLE LOOP TRANSFER SYSTEM

David J. Hale, Picket, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 28, 1980, Ser. No. 211,436
Int. Cl.³ F02B *33/04, 75/20*
U.S. Cl. 123—59 B **11 Claims**



1. An in-line, multi-cylinder, two-cycle, loop charged engine of the type having at least two transfer passages for each cylinder to transfer an air-fuel charge from the crankcase to the combustion chamber, each of said transfer passages having an inlet opening and an inlet port through the wall of a cylinder, said engine including a die-cast cylinder block comprising:

(A) a bank of parallel cylinders;

(B) a first transfer cavity for each of said cylinders defining a portion extending from said inlet opening to said inlet port of a first one of said transfer passages, said first cavity being free of projections which would prevent the withdrawal of a forming die in a first lateral direction,

and

(C) an exhaust cavity for each of said cylinders defining an exhaust passage, said exhaust cavities being free of projections which would prevent the withdrawal of a forming die in said first direction.

4,328,771

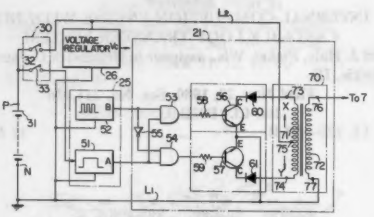
STARTING ASSIST SYSTEM FOR DIESEL ENGINES

Hisasi Kawai, Toyohashi; Seiji Morino, Aichi; Akira Fukami, and Hiroshi Hamaguchi, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 14, 1979, Ser. No. 75,678
Claims priority, application Japan, Oct. 31, 1978, 53-134128
Int. Cl.³ F02P *15/10*
U.S. Cl. 123—179 BG **8 Claims**

1. A starting assist system for a Diesel engine having at least one combustion chamber comprising:

a spark ignition plug positioned in said combustion chamber;
a DC power source having a pair of output terminals for generating a DC output;
preheating contacts connected to said DC power source;
ignition means connected to said DC power source through said preheating contacts, responsive to the output voltage of said DC power source upon closing of said preheating contacts for causing said spark ignition plug to discharge;
said ignition means including core means having an air gap;
a transformer having a primary coil wound on said core means and having a pair of primary terminals and a center terminal and a secondary coil wound on said core means, said center terminal being connected to one terminal of said DC power source; timing signal generating means connected to said preheating contacts, for generating an output during the closing of said preheating contacts; means, coupled to said timing signal generating means, for generating pulse signals having a constant predetermined frequency during the occurrence of the output of said timing signal generating means; and
a switching circuit including first and second switching elements each having a control input, said first switching



element coupled at one end thereof to one primary terminal of said primary coil and the other end thereof being adapted to be connected to the other terminal of said DC power source, and said second switching element being coupled at one end thereof to the other primary terminal of said primary coil and at the other end thereof being adapted to be connected to said other terminal of said DC power source; and diodes connected to said primary coil, for preventing an inverse current from flowing therein;
said control inputs being coupled respectively to said pulse signal generating means for receiving therefrom said pulse signals for controlling said switching elements to turn on and off an electric current through said primary coil alternately in response thereto, whereby during a time that said preheating contacts are held closed, there is induced across said secondary coil an AC pulse voltage containing a peaked high voltage of one polarity, at each leading edge thereof, sufficient to trigger a discharge of said spark plug, a subsequent high voltage sufficient to maintain the discharge of said spark plug, followed by a peaked high voltage of polarity opposite to said one polarity sufficient to trigger a discharge of said spark plug.

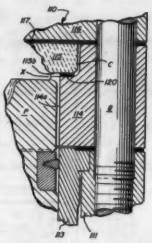
4,328,772

COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE

Hans Heydrich, Phoenix, Ariz.; Melvin E. Woods, Columbus, Ind., and William C. Geary, Ballston Lake, N.Y., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 14, 1980, Ser. No. 111,772
Int. Cl.³ F02F *1/18, 1/24*
U.S. Cl. 123—193 CH **8 Claims**

1. A combustion chamber for an internal combustion engine, comprising a cylindrical member including a cylindrical liner section and a separate cylindrical spacer section containing an inner concentric recess, the latter being of thermal insulative material and disposed in endwise coaxial relation spaced above said liner section and effecting separation of the liner section from an end piece; said end piece positioned substantially within and substantially closing off one end of the cylindrical spacer section of said member; a piston mounted for reciprocatory movement within said member, said piston when at a predetermined relative position coacting with said member



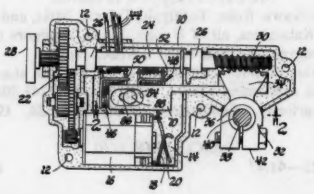
and end piece to form a combustion cavity; a compliant gas seal interposed the one end of said cylindrical spacer section and said end piece and in surface contact therewith and having a portion of said seal exposed to said combustion cavity; and means for retaining said end piece and cylinder member in assembled relation.

4,328,773

DIESEL ENGINE SHUTOFF ACTUATOR

Ronald O. Woodward, Muncie, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 2, 1980, Ser. No. 183,103
Int. Cl.³ F02B *77/08*
U.S. Cl. 123—198 DB **3 Claims**



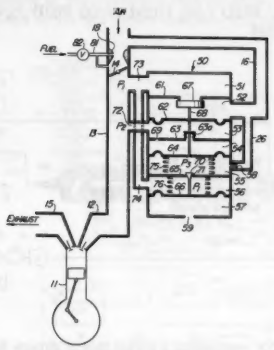
1. A diesel engine shutoff actuator for effecting cutoff of fuel in response to keyswitch operation to "off" position and fuel turn-on in response to keyswitch operation to "on" position comprising
a fuel control element mounted for movement between a fuel "on" and a fuel "off" position,
a reversible electric motor drivingly connected to the control element for moving the element from one position to another,
a pair of relays each having a switch connected to the motor and a coil connected to the keyswitch for energization to thereby establish relay energization and motor direction state according to keyswitch position,
a control circuit including the said relay switches for energizing the motor and determining its direction of rotation according to the energization states of the relays, whereby motor operation in the proper direction can be initiated to drive the control element from one position toward the other position, and
a mechanical feedback member coupled to the relay switches and the control element for movement thereby to selectively operate the relay switches as limit switches at the control element "on" and "off" positions respectively to de-energize the motor.

4,328,774

DEVICE FOR CONTROLLING NEGATIVE PRESSURE IN SUCTION PIPE OF INTERNAL COMBUSTION ENGINE

Masamitsu Asakura; Tomo Ito, and Chiaki Niida, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1979, Ser. No. 89,092
Claims priority, application Japan, Oct. 31, 1978, 53-134751
Int. Cl.[3] F02D *33/00*
U.S. Cl. 123—327 6 Claims



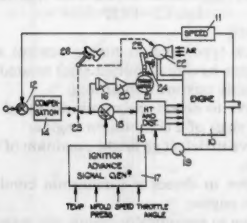
1. A device for controlling negative pressures in a suction pipe of an internal combustion engine comprising a first negative pressure detector for detecting a comparatively gradual increase of the negative pressure of an air-fuel mixture at a first location within said suction pipe, and a first valve for introducing air into said suction pipe in response only to detection of said gradual increase in negative pressure by said first negative pressure detector, a second negative pressure detector for detecting the negative pressure of the air-fuel mixture existing at a second location within said suction pipe, said second location being closer to said internal combustion engine than said first location, so as to sense an abrupt increase of the negative pressure of said air-fuel mixture in said suction pipe, and means for operating said first valve in response only to detection of said abrupt negative pressure increase by said second negative pressure detector for introducing air into said suction pipe.

4,328,775

CLOSED LOOP CONTROL OF I.C. ENGINE IDLING SPEED

John M. Ironside, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, Great Britain

Filed Jan. 26, 1981, Ser. No. 228,044
Claims priority, application United Kingdom, Jan. 30, 1980, 803132
Int. Cl.[3] F02P *5/04*; F02D *11/10*
U.S. Cl. 123—339 5 Claims



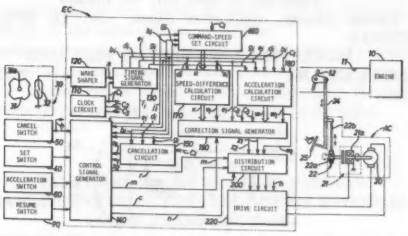
1. A method of controlling the idling speed of an internal combustion engine which comprises generating a signal representing the error between the actual engine speed and a desired idling speed, controlling the ignition timing of the engine directly in accordance with the error signal in a manner to cause the engine speed to approach the desired idling speed and controlling the admission of air or air/fuel mixture to the engine in accordance with the time integral of the error signal in a manner to cause the engine speed to approach the desired idling speed.

4,328,776

SPEED CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES

Akira Kuno, Oobu; Takeshi Matsui, and Yoshio Shinoda, both of Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 3, 1980, Ser. No. 166,699
Claims priority, application Japan, Jul. 9, 1979, 54-87271
Int. Cl.[3] B60K *31/00*; F02D *11/10*
U.S. Cl. 123—352 4 Claims



1. A speed control system for an automotive vehicle driven by an internal combustion engine under control of a throttle valve, the control system comprising:

first means for repetitively producing a timing signal with a period of time responsive to change of the actual speed of the vehicle;

second means arranged to be activated when the actual speed of the vehicle reaches a desired value, said second means producing a set signal upon activation thereof;

third means responsive to the set signal for producing an operation signal upon receiving the timing signal and for ceasing generation of the operation signal in response to one of the subsequent timing signals from said first means;

fourth means for producing a command signal indicative of a predetermined period of time defined by the desired speed of the vehicle;

fifth means responsive to the timing signal for calculating a first time difference between the predetermined period of time and the actual period of time of the timing signal and for producing a first differential signal indicative of a first absolute value of the calculated first time difference and a first sign signal indicative of the positive or negative sign of the calculated first time difference;

sixth means responsive to the timing signal for calculating a second time difference between the respective actual periods of time of the preceding and following timing signals and for producing a second differential signal indicative of a second absolute value of the calculated second time difference and a second sign signal indicative of the positive or negative sign of the calculated second time difference;

seventh means responsive to the timing and second differential signals during generation of the operation signal for producing a first correction signal indicative of the second absolute value, said seventh means being responsive to the timing signal and the first and second differential signals after disappearance of the operation signal for calculating the sum of the first and second absolute values when respective signs of the first and second sign signals are identical to each other and for calculating a difference

between the first and second absolute values when respective signs of the first and second sign signals are opposite to each other, said seventh means selectively producing second and third correction signals respectively indicative of the calculated sum and the calculated difference;

eighth means responsive to one of the first, second and third correction signals for selectively producing first and second output signals in relation to the positive or negative sign of the second sign signal; and

actuator means for increasing and decreasing the opening angle of said throttle valve respectively in response to the first and second output signals.

4,328,777

DISTRIBUTOR-TYPE FUEL INJECTION PUMP GOVERNOR

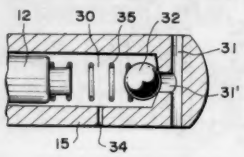
Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 9, 1980, Ser. No. 138,489

Claims priority, application Japan, Apr. 12, 1979, 54-47529[U]

Int. Cl.³ F02D *1/04*; F02B *1/10*; F02D *31/00*

U.S. Cl. 123—364 **7 Claims**



1. In a distributor-type fuel injection pump for an internal combustion engine, including:

a pump housing having an inner chamber charged with fuel;

means forming a pump work chamber in communication with said inner chamber;

a distributor plunger adjoining said pump work chamber and delivering a quantity of fuel to said engine for injection during each pressure stroke, said distributor plunger having a relief channel in communication with said pump work chamber;

a control sleeve mounted on said distributor plunger for controlling said relief channel; and

a governor mechanism controlling the axial position of said control sleeve to vary said quantity of injected fuel by changing the terminal moment of fuel delivery during each pressure stroke of said distributor plunger, said governor mechanism having a stantionary governor shaft, a governor sleeve axially displaceable on said governor shaft and having an inner space adjoined by said governor shaft and in communication with said inner chamber, centrifugal weights rotatable about said governor shaft while swinging outwardly displacing said governor sleeve in the direction to produce expansion of said inner space, and coupling means providing operative connection between said control sleeve and said governor sleeve;

in which said control sleeve is displaced in the direction to increase said quantity of injected fuel in response to displacement of said governor sleeve in the direction to produce contraction of said inner space;

the improvement comprising valve and channel means providing restricted communication between said inner space and said inner chamber upon displacement of said governor sleeve in the direction to produce contraction of said inner space and substantially unrestricted communication between said inner space and said inner chamber upon displacement of said governor sleeve in the opposite direction to produce expansion of said inner space.

4,328,778

DEVICE FOR CONTROLLING A DIESEL MOTOR DRIVEN PUMP DRIVE

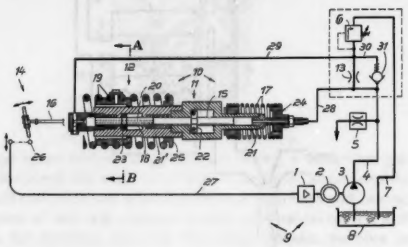
Adalbert Huperz, Hockenheim, and Wolfgang Maasberg, Hünxe-Krudenburg, both of Fed. Rep. of Germany, assignors to Woma-Apparatebau Wolfgang Maasberg & Co. GmbH, Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 136,768

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913230

Int. Cl.³ F02D *7/00*; F02M *41/00*; F02D *29/04*

U.S. Cl. 123—385 **12 Claims**



1. A device for regulating a diesel motor driven feed pump drive which includes a feed pump, a diesel motor, an injection pump associated with the diesel motor to control its operating characteristics, comprising a load, a variable resistance, a feed line connected in series from the feed pump to said load and to said variable pressure resistance, a sump for the feed pump connected to said variable resistance and said feed pump, and a control circuit connected to said feed line including a pressure scale portion and a pressure limiting device portion, a differential pressure manometer connected between said pressure scale portion and said pressure limiting device portion so that said pressure scale portion and said pressure limiting device portion are subjected to the flow medium at respective differential pressures, a regulating drive connected to said pressure scale portion and to the injection pump and subjected to the respective differential pressures to vary the operation of the injection pump.

4,328,779

FEEDBACK TYPE IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Tadashi Hattori, Okazaki; Hiroaki Yamaguchi, Anjo; Yoshinori Ootsuka, Okazaki; Kenji Goto, and Daisaku Sawada, both of Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 27, 1979, Ser. No. 97,663

Claims priority, application Japan, Dec. 7, 1978, 53-152334

Int. Cl.³ F02P *5/14*

U.S. Cl. 123—416 **4 Claims**

1. A feedback type ignition timing control system for a combustion engine having an output shaft rotated by the combustion of ignitable mixture comprising:

means effective to detect the rotational speed condition of the output shaft of a combustion engine;

means effective to detect an intake condition of said combustion engine;

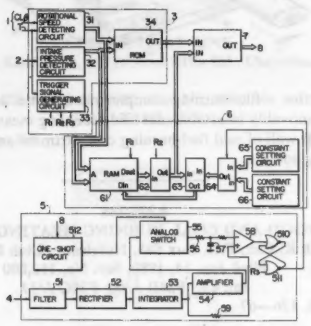
means effective to detect a combustion condition of said combustion engine;

means effective to periodically sample the detected combustion conditions to examine the number in percent of occurrences of a desired combustion condition relative to the sampled combustion condition;

means effective to provide first and second setting values which are selected in accordance with the examined percentage of the occurrences;

means capable of permanently storing a plurality of reference values indicative of desired ignition timings at the respective storage areas defined by the rotational speed and intake conditions of said combustion engine, said permanently storing means being effective to read out one of said reference values stored at the storage area corresponding to the detected rotational speed and intake conditions;

means capable of temporarily storing a plurality of correction values at the respective storage areas defined by the rotational speed and intake conditions of said combustion



engine, said temporarily storing means being effective to read out one of said correction values stored at the storage area corresponding to the detected rotational speed and intake conditions and to write a new correction value at the storage area from where said one of correction values is read out, said new correction value being derived from said one of correction values and one of said first and second values; and

means effective to correct said one of reference values by said one of correction values to determine an ignition timing in timed relation with which ignitable mixture is ignited.

4,328,780

GAS ANALYSIS

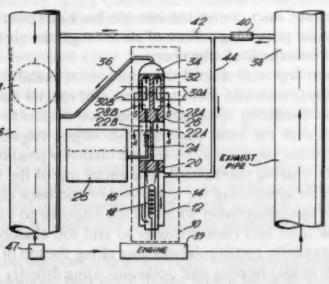
Sydney P. S. Andrew, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 2, 1979, Ser. No. 9,073

Claims priority, application United Kingdom, Feb. 3, 1978, 4442/78

Int. Cl.³ F02M *7/00*

U.S. Cl. 123—440 **23 Claims**



1. A method of analyzing for combustible or combustion supporting constituents an exhaust gas of an internal combustion engine having an air intake, including an induction air valve comprising the steps of:

(a) applying suction with the air intake to the exhaust gas to withdraw a sample stream thereof;

(b) forming a plurality of part streams of the sample stream, including first and second part streams;

(c) adding to the first part stream whichever of a combustible or combustion supporting constituent it is deficient in;

(d) subjecting the gas in the first stream, after step (c), and the second, untreated, part stream, to conditions effective to cause mutual reaction of combustible and combustion-supporting constituents;

(e) measuring the temperature difference between the first and second part streams after each is subjected to the conditions of step (d);

(f) allowing the first and second part streams, after step (e), to pass into the air intake under the influence of the applied suction from the air intake;

after step (a) and independently of step (b): (g) dividing the sample stream into a bypass stream and an analysis stream, said analysis stream being further acted upon in step (b);

(h) passing the bypass stream directly to the air intake upstream of the induction air valve; and

practicing step (f) so that the first and second part streams enter the air intake downstream of the induction air valve, the bypass stream balancing the pressure drop through steps (a)–(e) with that across the induction air valve.

4,328,781

EXHAUST GAS RECIRCULATING PASSAGE ARRANGEMENT FOR CROSS-FLOW TYPE INTERNAL COMBUSTION ENGINES

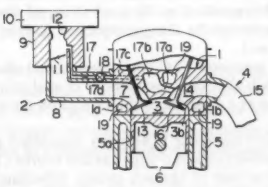
Yasuyuki Morita, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jul. 29, 1980, Ser. No. 173,435

Claims priority, application Japan, Jul. 30, 1979, 54/105911[U]

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—570 **7 Claims**



1. A cross-flow type internal combustion engine including cylinder block means having cylinder bore means, cylinder head means mounted on the cylinder block means to define combustion chamber means therein, intake port means formed in said cylinder head means at one side thereof and opening at one end to said combustion chamber means, exhaust port means formed in said cylinder head means at the other side thereof and opening to said combustion chamber means, said cylinder head means being formed with mating surface means where the other end of the intake port means is opened, intake manifold means attached to said cylinder head means and communicating with said intake port means, cooling medium jacket means formed in said cylinder head means for passing cooling medium therethrough, exhaust gas recirculating passage means formed in said cylinder head means adjacent to said intake port means and said jacket means, said exhaust gas recirculating passage means having one end opened to said exhaust port means and the other end opened at said mating surface means, expansion chamber means formed in said exhaust gas recirculating passage means adjacent to said intake port means and said jacket means.

4,328,782

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

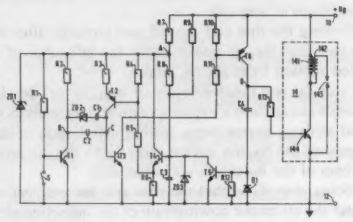
Werner Jundt, Ludwigsburg, and Herman Roozenbeek, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 56,963

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1978, 2833333

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—609 4 Claims



1. Ignition system for an internal combustion engine having an ignition coil having a primary (141) and a secondary (142) winding,

an ignition control transistor (144), connected in series with the primary winding;

a control signal source (S, T1) providing ignition control signals;

a controlled connection circuit (C2, C1, ZD2, T3, T6) including controlled semiconductor elements (T3, T6) and a storage element (C2) connecting said control signal source to the ignition current control transistor (144) to, selectively, control conduction and blocking thereof;

a controlled charge current source (T2, R3, R4) connected to said storage element (C2) to provide a charge thereon;

circuit means (C4, T5, T4) providing a speed dependent output signal including a charge capacitor (C3) and semiconductor switching means (T5) connected to said capacitor and controlled by the control signal source to charge and discharge the charge capacitor (C3) in each ignition cycle; and

a control transistor (T4) connected to said charge capacitor (C3) such that the conductivity of said control transistor changes as a function of the charge on the charge capacitor;

said control transistor (T4) being connected to control the conductivity of said charge current source (T2) so that the repetition rate of ignition cycles, reflecting speed of the engine, affects the charge on the charge capacitor (C3) and hence via the control transistor (T4) the charge current delivered by said charge current source.

4,328,783

PORTABLE PAPER BURNING COOKSTOVE

Donald S. Martenson, 24430 S. Highway 99E, Canby, Oreg. 97013

Filed Jun. 2, 1980, Ser. No. 155,421

Int. Cl.³ F24B *3/00*

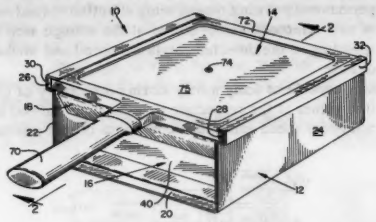
U.S. Cl. 126—25 R 14 Claims

1. A portable cookstove apparatus, comprising:

a base assembly including a first floor member and a pair of opposed sidewalls extending upwardly from opposite side edge portions of said floor member,

the upper edge portions of said opposed sidewalls defining cooking surface-receiving means for removable retention of a substantially flat cooking member,

a second floor member extending between said opposed sidewalls and suspended therefrom above and in spaced relationship to said first floor member, such that said first and second floor members define the upper and lower limits of a cooling duct open at opposite ends beneath said second floor, and such that said opposed sidewalls above said second floor member and said second floor member



define a fuel-burning compartment, and a cooking plate removably insertable into said receiving means to define a top wall of said fuel-burning compartment and said cooking surface.

4,328,784

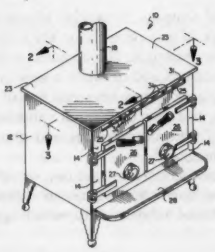
WOOD AND COAL BURNING HEATING UNIT

Kenneth K. Cox, P.O. Box 585, Hurricane, Utah 84737

Filed Jan. 14, 1980, Ser. No. 112,000

Int. Cl.³ F24B *3/00*; F24C *1/14*

U.S. Cl. 126—67 4 Claims



1. A wood or coal burning, heating unit comprising

a firebox having a bottom, spaced upright side walls, a back wall interconnecting the side walls, a front wall interconnecting the side walls and having a door opening therethrough, and a sheet metal top interconnecting said side, back and front walls, said sheet metal top forming substantially the entire top of said firebox, whereby the interior of said firebox will serve as a combustion chamber;

a back outer wall forming a back chamber with the back wall of the firebox;

an air inlet duct connected into the back chamber;

means for providing a flow of air through the air inlet duct and into the back chamber;

an outer top wall spaced from said sheet metal top of said firebox, with said front wall and said spaced upright side walls extending upwardly beyond said firebox to interconnect with the front edge and side edges, respectively, of said outer top wall to form a top chamber positioned over and covering substantially the entire top of the firebox;

means for connecting the upper end of said back chamber in flow communication with said top chamber so that air can flow from said back chamber to said top chamber;

a substantially rectangular opening along the top of the front wall of said heating unit communicating directly with said top chamber, said opening facing from the front of the heating unit so that heated air flows from said top chamber outwardly from the rectangular opening in the top of the front wall of said heating unit;

a plurality of spaced apart, elongate, upstanding metal fins welded to said sheet metal top of said firebox said fins being disposed upwardly from said sheet metal top into said top chamber to form flow channels in said top chamber between mutually adjacent fins so that the flow of air through said top chamber passes through said flow channels, whereby heat is conducted through said fins from said sheet metal top of said firebox and then transferred from the fins to the air flowing through said flow channels; and

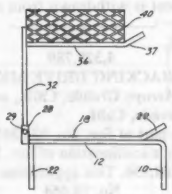
door means connected to the front wall of said firebox and adapted to close the door opening therein.

4,328,785

FIREPLACE HEAT SINK

Lawrence K. Kishiyama, 11716 Four Mile Rd., Cheyenne, Wyo. 82001

Filed Sep. 22, 1980, Ser. No. 189,734
Int. Cl.³ F23H *13/06*
U.S. Cl. 126—165 **1 Claim**



1. A log burning grate and heat sink device comprising:

(A) a unitary lowermost grate means for holding a plurality of logs thereon in a fireplace and having:

(1) a rigid generally rectangular frame defined by a pair of elongated spaced parallel horizontally extending rigid front and rear support members and a pair of elongated spaced parallel horizontally extending rigid side support members with front end portions extending outwardly beyond the front support member;

(2) a plurality of spaced parallel horizontally extending rigid cross support members extending laterally between said front and rear support members with upwardly inclined front end portions extending outwardly beyond the front support member;

(3) a pair of spaced front leg members extending vertically downwardly from said front end portions of said side support members;

(4) a pair of spaced rear leg members extending vertically downwardly from said rear support member and being located between and spaced inwardly of said front leg members;

(5) a pair of spaced upwardly extending tubular sleeve members rigidly connected to said rear support member adjacent said rear leg members;

(B) an uppermost perforate basket means rigidly mounted on said lowermost grate means in upwardly spaced relationship thereto for holding a pile of volcanic rocks above the logs on the lowermost grate means adjacent to a fireplace chimney opening whereby the rocks are heated by combustion gases during burning of the logs and thereafter radiate heat outwardly from the fireplace; said basket means having a rectangular peripheral configuration with a width approximately equal to the distance between said front and rear support members and a length less than the distance between said side support members of said grate means;

(C) basket support means for rigidly supporting said basket means above said grate means which includes only a pair of spaced parallel generally L-shaped support members each of which comprises:

(1) a vertically extending support section having a lower end portion mounted in one of said tubular sleeve members adjacent and rigidly supported by the rear support member of said grate means and an upper end portion adjacent the chimney opening; and

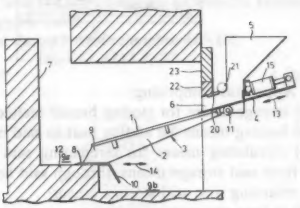
(2) an horizontally extending support section rigidly connected to said upper end portion and extending forwardly therefrom in cantilever fashion toward the front of the fireplace.

4,328,786

COAL BURNING GRATE

Douglas B. Owen, Toowoomba, Australia, assignor to Clayware Pty. Ltd., Toowoomba, Australia

Filed Nov. 30, 1979, Ser. No. 98,841
Int. Cl.³ F23H *7/08*
U.S. Cl. 126—174 **6 Claims**



1. A coal-burning grate for a furnace, comprising:

(a) a feed hopper for feeding coal to the interior of said furnace;

(b) a grate member mounted for reciprocating movement, one end of said grate member being positioned adjacent to and below said hopper, said grate member receiving coal from said hopper and supporting the same during combustion thereof as it passes downwardly over said grate member;

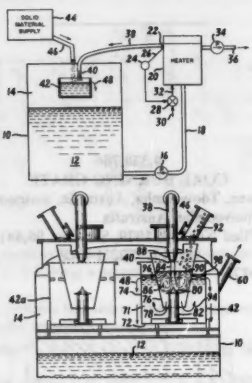
(c) a shoe attached to the other end of said grate member and spaced from the surface of said grate member, said shoe engaging and being slidably supported on the floor of the furnace, the space between said shoe and the surface of said grate member, and the area in front of said grate member, defining an ash receptacle area in the furnace;

(d) means for reciprocating said grate member, whereby when said grate member is moved rearwardly it is in a position to receive fresh coal from the bottom of said hopper, with said shoe simultaneously carrying burnt ash rearwardly from said ash receptacle area thus permitting ash from above said grate member and which is no longer supported thereby to drop into said ash receptacle area; subsequent forward movement of said grate member serving to carry fresh coal into the furnace and simultaneously effecting contact of the burnt ash carried rearwardly with said shoe with the burnt ash subsequently dropped into said ash receptacle area, as a result of which the burnt ash carried by said shoe is pushed off into an ash pit under said furnace, the ash carried by said shoe and located in said ash receptacle area providing an ash seal preventing the entry of unwanted air into the furnace.

4,328,787
METHOD AND ARRANGEMENT FOR MELTING OF PITCH ETC.

William Bruff, and Kjell B. Petersen, both of Kristiansand, Norway, assignors to Mosal Aluminium, Elkem-Spigerverket A/S & Co., Oslo, Norway

Continuation-in-part of Ser. No. 872,304, Jan. 25, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,557
Claims priority, application Norway, Jan. 27, 1977, 770272
Int. Cl.[3] E01C *19/45*
U.S. Cl. 126—343.5 A 21 Claims



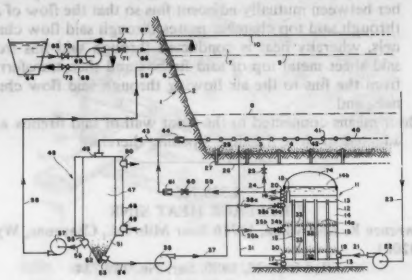
1. Apparatus comprising:
(a) storage means for storing heated melted material;
(b) heating means for adding heat to said melted material;
(c) circulating means for circulating said melted material from said storage means, through said heating means and returning it to said storage means;
(d) at least one melting container interposed in the circulation of said melted material being returned to said storage means;
(e) means for adding material to be melted to said melting container;
(f) said storage means being no more than partly full of said heated melted material, whereby a free space is left over the surface of said heated melted material;
(g) said at least one melting container being disposed in said free space above said surface;
(h) a roof sealably closing the top of said storage means and enclosing said at least one melting container therein; and
(i) means for drawing off gases and vapors from said free space.

4,328,788
HEAT STORAGE IN A POND CONTAINING A SATURATED AQUEOUS SALINE SOLUTION

Joseph M. Wirguin, 40 King George St., Jerusalem, and Avraham Melamed, 31 Haoranim St., Kfar Shmaryahu, both of Israel

Continuation of Ser. No. 31,107, Apr. 18, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,886
Claims priority, application Israel, Apr. 30, 1978, 54597
Int. Cl.[3] F24J *3/02;* F28D *13/00*
U.S. Cl. 126—415 43 Claims

27. A method of heat storage and supply, wherein a thermal pond is set up holding a body of an aqueous solution of a solute whose water solubility increases with temperature, the concentration, density and temperature of said solution decreasing towards the top, said body of solution being saturated with said solute at each level at the temperature there prevailing; said solute is provided in solid form on the bottom of said thermal pond in contact with said body of solution; said thermal pond is exposed to conditions at which the bottom region of said

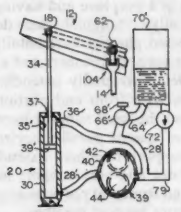


body of solution stores heat whereby some of said solid solute is dissolved; and heat is withdrawn from said bottom region.

4,328,789
SOLAR TRACKING DRIVE MECHANISM

David H. Nelson, Arroyo Grande, Calif., assignor to American Solar, Arroyo Grande, Calif.

Continuation-in-part of Ser. No. 934,847, Aug. 18, 1978, abandoned, which is a continuation of Ser. No. 744,290, Nov. 2, 1976, Pat. No. 4,108,154. This application Sep. 24, 1979, Ser. No. 78,464
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—425 2 Claims



1. In a solar energy collection system in which a solar energy absorbing structure is rotated about a longitudinal axis mounted upon a support under the control of a drive mechanism to face the sun, the improvement comprising damping means including:
a hydraulic cylinder having a barrel, a piston reciprocal within said barrel and dividing said barrel into two chambers, a piston rod connected to said piston and extending from said barrel through one of said chambers for effectuating rotation of said solar energy absorbing structure, said drive mechanism including gear motor and hydraulic fluid transfer lines connected from said gear motor to opposite ends of said hydraulic cylinder to said chambers on opposite sides of said piston, further characterized in that said damping means is comprised of a single hydraulic cylinder having a barrel, and one of said barrel and piston rod is connected to said support and the other of said barrel and piston rod is connected to said solar energy absorbing structure at a location displaced from said axis, and said barrel has a blind end forming one of said chambers and an opposite end forming an opposite chamber surrounding said piston rod, and further comprising a hydraulic fluid reservoir and a hydraulic by-pass line connected to said reservoir and one hydraulic fluid transfer line leading to said opposite chamber in said cylinder barrel and further including means for allowing fluid flow

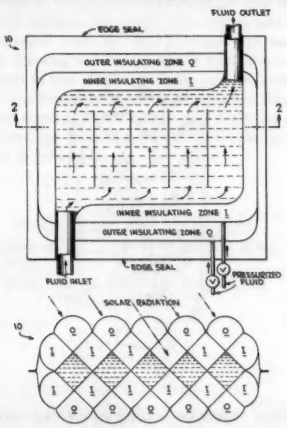
from said hydraulic fluid reservoir through another hydraulic fluid transfer line to said gear motor when said gear motor is operated in one direction of rotation to supply fluid to said blind end of said hydraulic cylinder, and for preventing fluid flow to said reservoir from said gear motor when said gear motor is operated in said other direction of rotation to withdraw fluid from said blind end of said hydraulic cylinder, and further including means for allowing passage of hydraulic fluid through said bypass line when said gear motor is operated in said other direction of rotation and for preventing transfer of hydraulic fluid therethrough when said gear motor is operated in said one direction of rotation.

4,328,790

INSULATED INFLATABLE SOLAR COLLECTOR WITH STRENGTHENING MATRIX CONFIGURATION

John D. Kircus, 1226 Francais Dr., Shreveport, La. 71118

Filed Apr. 14, 1980, Ser. No. 139,682
Int. Cl.³ F24J 3/02
U.S. Cl. 126—426 **6 Claims**



1. An inflatable solar collector through which a fluid medium can flow so as to be heated by solar radiation and which is constructed to prevent heat loss from the heated fluid medium flowing therethrough to the surrounding atmosphere, and which has a strong matrix construction and is easily manufactured, said collector comprising:

an upper flexible plastic manifold-forming sheet and a lower flexible plastic manifold-forming sheet, said upper and lower manifold-forming sheets being correspondingly shaped and sealingly joined at their peripheries and also joined along parallel portions of their interiors so as to form a manifold therebetween defining multiple parallel fluid medium flow channels,

means for supplying fluid medium to be heated to one side of the parallel fluid medium flow channels in said manifold and means for removing heated fluid medium from the other side of the parallel fluid medium flow channels in said manifold,

first flexible plastic covering sheets respectively positioned on top of said upper flexible plastic manifold-forming sheet and beneath said lower flexible plastic manifold-forming sheet, said first covering sheets being connected to said upper and lower manifold-forming sheets to form inner inflatable insulating zones around said manifold,

second flexible plastic covering sheets respectively positioned on top of said first flexible plastic covering sheet located on top of said upper flexible plastic manifold-forming sheet and beneath said first flexible plastic covering sheet located beneath said lower flexible plastic manifold-forming sheet, said second covering sheets being connected to said first covering sheets to form outer inflatable insulating zones around said manifold,

separate means for supplying pressure fluid to inflate said inner and outer insulating zones, and

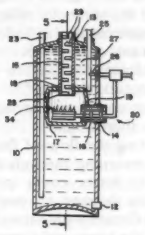
wherein all of said flexible plastic sheets are joined at their contiguous peripheries; wherein said first flexible plastic covering sheets are respectively connected to said upper and lower flexible plastic manifold-forming sheets along interior lines which extend parallel to the connection lines joining said upper and lower flexible plastic manifold-forming sheets and halfway between planes extending vertically through said connection lines, and wherein said second flexible plastic covering sheets are respectively connected to said first flexible plastic covering sheets along interior lines which extend in planes which extend vertically through said connection lines so as to create a strengthening matrix configuration for said solar collector when inflated.

4,328,791

GAS SUPPLEMENTED SOLAR COLLECTOR STORAGE MEANS

Henry J. Moore, Jr., Los Angeles, and Lindy J. Bressickello, Baldwin Park, both of Calif., assignors to Mor-Flo Industries, Inc., Santa Monica, Calif.

Filed Jun. 13, 1980, Ser. No. 159,180
Int. Cl.³ F24J 3/02
U.S. Cl. 126—427 **6 Claims**



1. A gas supplemented solar collector storage means including, in combination:

(a) a water tank having supply and return connections for circulating water from said tank to a solar collector and back to the tank;

(b) a gas heating means disposed within the upper half of said tank for supplementing the heating of water in said tank by solar energy in the event the temperature of the water should drop below a minimum amount; and

(c) a thermostat responsive to the temperature of water in the upper half of said tank for automatically turning the gas heating means on when said temperature drops below said minimum amount, said gas heating means including a combustion chamber in the upper half of said tank having side and top openings; a flue pipe passing from the top of the tank to connect to the top opening and an inlet cylinder passing from the side of the tank to connect to the side opening; and gas burner means in said chamber connected for operation by said thermostat to thereby generate heat and provide for a heat exchange with water surrounding said chamber, flue pipe and inlet cylinder, said flue pipe and inlet cylinder serving the additional function of constituting the sole support for said combustion chamber in said tank.

4,328,792

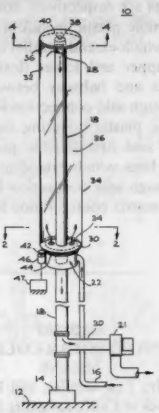
SOLAR HEAT COLLECTOR

Marvin W. Shores, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jan. 14, 1980, Ser. No. 112,053

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **14 Claims**



1. Solar energy collecting apparatus comprising:

a solar collector including a parabolic reflector supported on a vertical mast, the mast being hollow and extending along the focal axis of the reflector to heat fluid within the mast;

an enclosure for the parabolic reflector including at least a portion of a right circular cylinder having its axis aligned with the focal axis of the reflector and defining, with said reflector, a chamber for the flow of fluid vertically along the reflector outside the mast;

upper and lower covers connected with the chamber to close the ends thereof; and

means for directing the flow of fluid upward through the chamber and returning through the mast, comprising an opening in the lower cover communicating with the chamber outside the mast, an opening in the mast adjacent the upper end thereof within the chamber, and an opening in the mast at the lower end thereof outside the collector, the opening being effective to permit the flow of fluid through the collector as it is heated initially in said chamber during upward flow and subsequently in said mast during return flow.

4,328,793

MULTI-MODAL LOW NOISE INCUBATOR

Paul F. Martin, 86 Townsend Rd., Wellington, New Zealand

Continuation-in-part of Ser. No. 857,913, Dec. 6, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,136

Claims priority, application New Zealand, Dec. 20, 1976, 182924

The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.

Int. Cl.³ A61G *11/00*

U.S. Cl. 128—1 B **15 Claims**

1. A multi-modal incubator for animals including human beings comprising:

a chassis having upstanding sides,

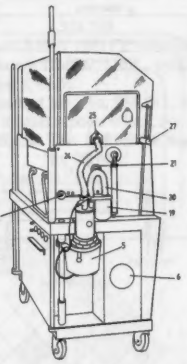
a bedding support mounted on the top of said chassis,

an incubator containing mounted on the top of said chassis, comprising a transparent cover having sides and a top which defines an enclosure supplied with a life-support fluid above and substantially around the bedding support,

means defining at least one access opening in a side of said cover for allowing at least a person's arm to be extended through said side into said enclosure, said access opening having top, bottom, and side portions, rigid means movably disposed to the outside of said cover means to allow for opening and substantial closing of said access opening,

means for providing said enclosure with an environment having a gas pressure above that externally of said enclosure, said means defining said at least one access opening including self-supporting canopy-like flange means projecting inwardly and downwardly of said enclosure at the top portion of said access opening and extending at least along upper parts of said side portions of said access opening, said flange means extending further into said enclosure at upper regions of said flange means than at lower regions of said flange means whereby, opening said access opening will not allow any substantial rolling over by air from outside the access opening into said enclosure to hence affect the incubator environment,

a plenum chamber mounted on said chassis beneath said enclosure and bedding support, which chamber is in communication with the interior of said enclosure sufficient to permit limited recirculation fluid flow between said plenum chamber and the interior of said enclosure,



an electrical resistance heating means disposed in said plenum chamber so as to permit heating the lift-support fluid passing therethrough,

a life-support fluid supply source of ambient air, oxygen, or a mixture thereof located external to both the incubator cover and the plenum chamber,

a removable conduit means, connecting said fluid supply source to said plenum chamber,

a fan mounted on said chassis external to said plenum chamber and incubator cover and operably connected to said life support fluid supply source and to said conduit means to supply said life support fluid under pressure to said plenum chamber,

a removable bacterial filter mounted on said chassis and located between said fan and said plenum chamber, and

a monitor mounted on said chassis operably associated with said incubator so as to be capable of controlling the environment within said enclosure by controlling at least said electrical resistance heating means.

4,328,794

TRACTION SPLINT

Robert E. Holmes, 7600 Mine Valley Dr., Raleigh, N.C. 27609

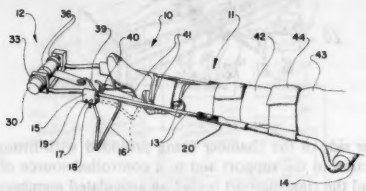
Filed Apr. 11, 1980, Ser. No. 139,451

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—85 **5 Claims**

1. An improved traction splint type device comprising: a pair of elongated, generally parallely disposed side members; means connecting said members adjacent one end thereof; a traction mechanism support means secured to and extending

between said members adjacent their ends opposite said connecting means; a traction belt pick-up shaft rotatively mounted on said support means adjacent one of said side means; a bushing means fixedly mounted on said support means adjacent said other side means and rotatively mounting said shaft, said bushing outwardly projecting on one side of said support means; a shoulder means fixedly secured to the end of said shaft and being disposed adjacent said bushing; a coil spring means wound about said bushing and said shoulder; a housing knob



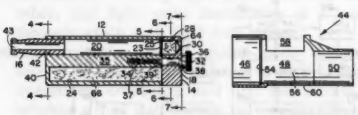
covering at least a portion of said shoulder and its adjacent spring; a release means connected to one end of said spring and rotatively mounted between said housing and said support whereby said housing can be rotated in one direction only to rotate said shaft in that direction while said ring can rotate in the opposite direction only to rotate said shaft in that direction; and belt means secured at one end to said shaft and at its other end to an appendage requiring traction whereby an improved traction splint is provided.

4,328,795

SMOKELESS TOBACCO PIPE

Weldon B. Cabaniss, III, 2118 NW. Military Hwy., San Antonio, Tex. 78213

Filed May 5, 1980, Ser. No. 146,794
Int. Cl.³ A24F *1/26*
U.S. Cl. 131—180 **10 Claims**



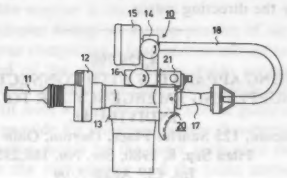
1. A device for smoking combustible materials comprising:
a body member having a smoke passage within said body member;
at least one chamber for storing said combustible materials located within said body member and separate from said smoke passage;
a cap member containing a recessed portion for burning said combustible materials therein;
an orifice located in said cap member for communicating from the atmosphere to said recessed portion; said orifice being less than three centimeters in diameter to prevent substantial loss of combustible material from said recessed portion and through said orifice to outside of said device and to prevent substantial amounts of smoke produced by burning said combustible material within said recessed portion from passing out through said orifice and into the atmosphere by preventing significant gaseous communication between the atmosphere and said combustible material through said orifice in the absence of an air pressure differential between said recessed portion and said atmosphere and;
said cap member being rotatably attached to a front end of said body member and having a first orientation wherein said recessed portion of said cap member is directly adjacent to and opens into a front end of said smoke passage, and a second orientation wherein said recessed portion is directly adjacent to and opens into a front end of said chamber.

4,328,796

RESPIRATION PACEMAKING VALVE FOR RESUSCITATION APPARATUS SUCH AS RESPIRATORS

Taisto Häkkinen, Kaarlonkatu 25, 13210 Hiieenlinna 21, Finland

Filed Jan. 3, 1980, Ser. No. 109,433
Claims priority, application Finland, May 1, 1979, 790038
Int. Cl.³ A61M *11/02*
U.S. Cl. 128—200.14 **5 Claims**



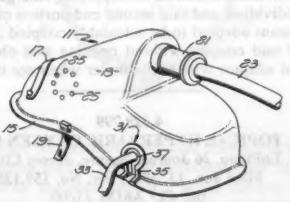
1. Respirator apparatus comprising:
a drug atomizer;
regulating valve means fluidly connected to said drug atomizer for controlling respiratory pressure and for controlling a flow of air or oxygen to said drug atomizer; and
a respirator pacemaker valve directly connected to said drug atomizer and including a body member defining a fluid flow passage therein in fluid communication with said regulating valve means and having gas inlet means for receiving air or oxygen from a source thereof and directing the same into said fluid flow passage, a spindle member mounted within said fluid flow passage for movement between a first position wherein said fluid flow passage is closed to prevent fluid communication between said gas inlet and said regulating valve means and a second position wherein said fluid flow passage is open to allow said fluid communication, and a trigger member pivotally connected to said body member and operable through the application of finger pressure thereto for moving said spindle member between said open and closed positions, said trigger member having a portion coupled to said spindle member for movement thereof upon actuation of said trigger member.

4,328,797

NASO-GASTRIC OXYGEN MASK

Offord L. Rollins, III, and Anthony F. Williams, both of 3772 Lockland Dr., #20, Los Angeles, Calif. 90008

Filed Jul. 23, 1980, Ser. No. 171,644
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—202.27 **24 Claims**



1. A face mask for the administration of a gas such as oxygen comprising
a mask body of such size and shape adapted to cover at least the nose of a patient and having a peripheral edge;
means for holding the mask against the face of a patient;

means for directing a flow of a gas to the interior of the mask;

means about the peripheral edge of the body for substantially sealing at least a portion of the body of the mask against the skin of the patient; and

means for admitting a naso-gastric tube into the interior of the mask body for insertion into the nostril of the patient comprising

a fenestration in the body extending through the peripheral edge and sealing means and located in a convenient position for allowing the passage of the tube through the fenestration and into the nostril of the patient, and

means for substantially closing the fenestration to prevent the loss therethrough of gas directed into the mask body by the directing means.

4,328,798

BREATHING APPARATUS WITH CONNECTOR SYSTEM FOR SUPPLYING EMERGENCY AIR TO ANOTHER INDIVIDUAL

Max Isaacson, 125 Sunrise Place, Dayton, Ohio 45407

Filed Sep. 8, 1980, Ser. No. 185,295

Int. Cl.³ A62B 7/04

U.S. Cl. 128—202.27 **4 Claims**

1. Breathing apparatus adapted to be carried by a fire-fighter or other rescue individual, comprising a face mask, a pressure regulator adapted to receive pressurized air from a supply tank, conduit means connecting said facemask to said pressure regulator, a demand inhalation valve in said conduit means receiving air from said pressure regulator and responsive to the breathing demands of the individual, a quick release coupler including inlet means having a normally closed check valve therein and connected to receive air from said pressure regulator, a separate tubular adaptor having one end portion including means releasably coupled into said inlet means of said coupler, said one end portion having means effective to open said check valve when coupled to said coupler, said adaptor having a second end portion including means for releasably receiving a breathing tube extending from a face mask of a second individual in distress for supplying emergency air to the second individual, and said second end portion of said adaptor having means adapted to be releasably coupled into said inlet means of said coupler without opening said check valve to retain said adaptor with said coupler when not in use.

4,328,799

SACRAL TOPICAL HYPERBARIC OXYGEN CHAMBERS

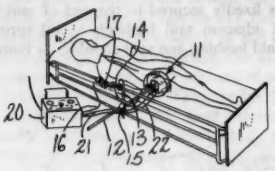
Rocco W. LoPiano, 26 Journal Square, Jersey City, N.J. 07306

Filed Jun. 13, 1980, Ser. No. 159,125

Int. Cl.³ A61M 35/00

U.S. Cl. 128—207.26 **2 Claims**

1. A hyperbaric oxygen treatment apparatus for use by a patient recumbent on a bed comprising, an open-faced chamber and an adjustable rigid support therefore, the chamber having a closed rear side and an open front side, the opening in the front side of the chamber being defined by a forwardly projecting first gasket presenting a resilient feather edge which is adapted for substantially gas-tight engagement with a human body surface along a line surrounding an area to be treated, and



the rear side of the chamber being provided with fittings for connection to the support and to a controlled source of oxygen, and the rigid support including articulated members connecting the chamber to at least one bed rail.

4,328,800

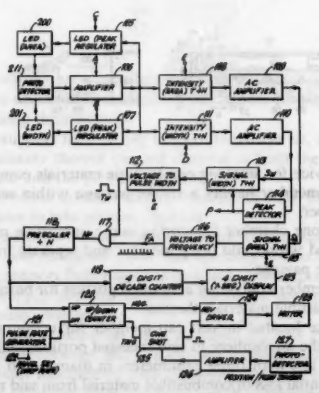
AUTOMATED INTRAVENOUS FLUID REGULATING AND ADMINISTERING APPARATUS

Alvin J. Marx, 107 Georgian Court Rd., Rochester, N.Y. 14610, and Darold C. Wobschall, Williamsville, N.Y., assignors to Alvin J. Marx, Rochester, N.Y.

Filed Oct. 30, 1980, Ser. No. 202,412

Int. Cl.³ A61M 5/00

U.S. Cl. 128—214 E **10 Claims**



1. An intravenous fluid regulator apparatus comprising:

means for generating a first signal representing a desired rate of introduction of drops of intravenous fluid to a patient,

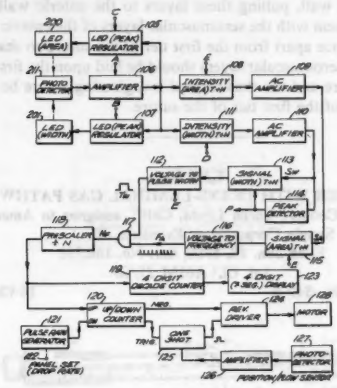
means for sensing the volume of each of said drops of fluid, said sensing means including at least two light sources, radiation emanating from each of said sources being selected to lie along light paths perpendicular to each other, said light paths intersecting at a sensing point through which each fluid drop passes,

means responsive to said sensing means for generating a second signal bearing a relation to drop volume, and for operatively combining said first and second signals to produce a fluid introduction rate control signal.

4,328,801
AUTOMATED INTRAVENOUS FLUID REGULATING AND ADMINISTERING APPARATUS

Alvin J. Marx, 107 Georgian Court Rd., Rochester, N.Y. 14610, and William D. Friedman, Rochester, N.Y., assignors to Alvin J. Marx, Rochester, N.Y.

Continuation-in-part of Ser. No. 202,412, Oct. 30, 1980. This application Nov. 6, 1980, Ser. No. 204,657
Int. Cl.³ A61M *5/16*
U.S. Cl. 128—214 E **10 Claims**

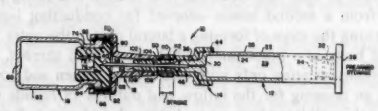


1. An intravenous fluid regulator apparatus comprising:
means for generating a first signal representing a desired rate of introduction of drops of intravenous fluid to a patient,
means for sensing the volume of each of said drops of fluid, said sensing means including at least two diffuse light sources arranged to produce converging light beams, radiation from each of said converging light beams being selected to lie along light paths perpendicular to each other, said light paths intersecting at a sensing point through which each fluid drop passes,
means responsive to said sensing means for generating a second signal bearing a relation to drop volume, and for operatively combining said first and second signals to produce a fluid introduction rate control signal.

4,328,802
WET DRY SYRINGE PACKAGE

Edward M. Curley, Bethesda, Md., and Gerlof Homan, Olivette, Mo., assignors to Survival Technology, Inc., Bethesda, Md.

Filed May 14, 1980, Ser. No. 149,570
Int. Cl.³ A61J *1/00*
U.S. Cl. 128—272.1 **4 Claims**

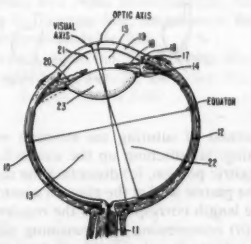


1. A wet-dry syringe assembly adapted for storage in a prearmed condition ready for instant arming, said assembly consisting of:
(1) a syringe having a cylindrical barrel open at its rearward end and closed at its forward end, a piston slidably carried within the barrel adjacent the rearward end to close that end off and form a liquid chamber between the forward end of the piston and the closed end of the cylindrical barrel, a needle positioned in the forward closed end of the cylindrical barrel with its inner end in direct communication with the liquid chamber to establish fluid communication between the liquid chamber and the forward exposed end of the needle,
(2) a syringe adapter fitting over the forward end of the syringe, said syringe adapter comprising an enlarged head portion snugly engaging and fitting on the forward end of the syringe barrel, a tubular needle guide portion of reduced diameter extending forwardly from the head portion, the length of said tubular portion being less than the needle it surrounds,
(3) a medicament vial adapted to carry the dry medicament and to receive the liquid stored in the syringe, said vial having a closed bottom and open top portion, a stopper for closing the open top portion, a retaining member for holding the stopper in the vial,
(4) a vial adapter fitting on the top portion of the vial said vial adapter comprising a base portion affixed to the stoppered end of the vial, a tubular guide projecting outwardly from the base, said guide having an inner diameter sized to fit over a portion of the needle guide of the syringe to provide for telescopic action therebetween,
(5) cooperating means on the inner surface of the tubular guide on the vial adapter and the outer surface of the needle guide of the syringe adapter to maintain the syringe and the vial in spaced prearmed storage position wherein the forward end of the syringe needle is embedded in the vial stopper, to thereby insure complete sterility between needle, liquid chamber and vial and to maintain the syringe and the vial in armed position with the end of the needle projecting through the stopper into the vial to establish fluid communication between the syringe medicament chamber and the vial.

4,328,803
OPHTHALMOLOGICAL PROCEDURES

Lawrence G. Pape, Scarsdale, N.Y., assignor to Opthalmic Systems, Inc., Long Island City, N.Y.

Filed Oct. 20, 1980, Ser. No. 198,290
Int. Cl.³ A61B *17/00*; A61K *31/70*
U.S. Cl. 128—276 **21 Claims**



1. In a method for protecting delicate human eye structures during ophthalmological surgical procedures by introducing into the anterior segment thereof a given volume of highly viscous physiologically buffered solution containing a sufficient concentration of sodium hyaluronate to protect delicate eye tissue, cells and structures, the improvement comprising diluting said volume in site thereby reducing the concentration thereof prior to closure such that abnormally high post-operative intra-ocular pressure within the human eye is avoided.

4,328,804

HYGIENIC TAMPON AND TAMPON APPLICATOR

Kazuo Shimatani, No. 249, Kamisoyagi, Yamato-shi, Kanagawa-ken, Japan

Filed Nov. 15, 1979, Ser. No. 94,657
Claims priority, application Japan, Nov. 16, 1978, 53/158016[U]; Dec. 30, 1978, 53/179198[U]
Int. Cl.³ A61F 13/20
U.S. Cl. 128—285 6 Claims

1. A hygienic tampon comprising:

a rope-shaped absorbent material having a length of about 10 to 12.3 cm, a diameter of about 1.2 to 3 cm and an uncompressed volume of about 15 to 30 cm^3;

the rope-shaped material being initially loosely coiled to form a single coil having unconnected parallel spaced turns and being thereafter compressed into the form of a shank having a rounded head end, with a withdrawal string attached to an opposite end of the rope-shaped absorbent material;

said shank being about 4.4 to 5.0 cm long, 1.2 to 2.5 cm in diameter and having a compressed volume of about 5 to 10 cm^3;

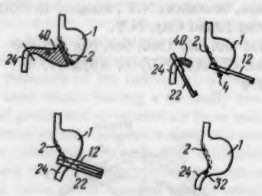
said shank expanding upon absorbing liquid and freely uncoiling to said uncompressed volume.

4,328,805

METHOD OF SUTURING THE ORGANS OF THE GASTROINTESTINAL TRACT

Ernest M. Akopov, Alexeevsky studenchesky gorodok, 6b proezd, 5a, Kv. 28, and Petr M. Postolov, Sadovo-Triumfalnaya ulitsa, 4/10, kv. 105a, both of Moscow, U.S.S.R.

Filed Oct. 3, 1980, Ser. No. 193,887
Int. Cl.³ A61B 17/04
U.S. Cl. 128—334 R 5 Claims



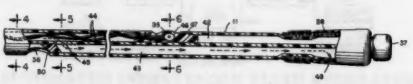
1. A method of suturing the stomach with the intestine, incorporating: (a) stitching up the stomach, (b) severing the resected gastric portion, (c) dissecting the seromuscular layers along of the gastric wall at the place of anastomosing along the line whose length corresponds to the required size of the anastomosis, (d) compressing the remaining gastric portion in a close proximity to the place of the abovesaid dissecting of the seromuscular layers, (e) catching the opposite semiperimeters of the gastric wall by the mucosubmucous layers in front of the line of compression of the remaining gastric portion on the side of establishing the required anastomosis, (f) severing the affected gastric portion some distance apart from the line of catch on the outer side of the remaining gastric portion, (g) compressing and catching the enteric wall on its segment the length of which corresponds to the size of the caught semiperimeters of the gastric wall within the zone of the anastomosis being established, followed by severing the resected enteric segment, (h) bringing apart the caught portions of the enteric wall and the seromuscular layers of the gastric wall along the semiperimeters thereof, (i) approximating the stomach and the intestine until the brought-apart wall portions contact each other with simultaneously apposing the semiperimeters, (j) suturing the apposed enteric and gastric walls to form a first tier of the suture passing through all the layers of the enteric wall but only through the mucosubmucous layers of the gastric wall, (k) releasing the walls of the organs sutured from catching and compressing, (l) catching the seromuscular layers of the gastric wall, pulling these layers to the enteric wall and stitching them with the seromuscular layers of the enteric wall some distance apart from the first tier of the suture so that the cut of the seromuscular layers should be laid upon the first tier of the suture and the thus-formed invaginating suture be situated aside of the first tier of the suture.

4,328,806

CATHETER WITH TRANS-LUMINAL GAS PATHWAY

Robert P. Cooper, Yorba Linda, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 18, 1980, Ser. No. 160,750
Int. Cl.³ A61M 25/00
U.S. Cl. 128—349 B 16 Claims



1. A catheter comprising a catheter body having an elongated tubular wall formed of flexible material and having proximal and distal ends; pressure responsive means mounted upon said body adjacent the distal end thereof; said catheter body having first and second lumens extending from said proximal end to said distal end and separated by a longitudinal septum; a port in said wall of said body communicating with said second lumen and being located intermediate said distal and proximal ends; at least one electrical lead extending through portions of said first lumen both proximal and distal to said port; sealant plug means disposed within said second lumen adjacent said port to block communication between the portion of said second lumen proximal to said port and the portion of said second lumen distal to said port without obstructing flow communication between said proximal portion of said second lumen and said port; and an aperture through said septum to place said distal portion of said second lumen in communication with said first lumen.

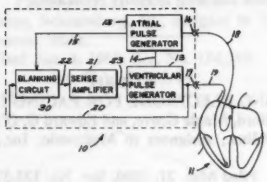
9. A method of forming a gas flow passage in a catheter having proximal and distal ends and having a plurality of parallel lumens therein, a first one of said lumens being adapted to receive at least one electrical lead therein and being separated from a second lumen adapted for conducting liquids; comprising the steps of forming a lateral port in the outer wall of said body at a point intermediate the length thereof, said port communicating only with said second lumen and constituting an opening for the inflow and outflow of liquids with respect thereto; introducing a tool through said port to form an aperture in said septum placing said first and second lumens in communication with each other; then introducing a sealant plug into said second lumen through said port to (a) block communication between the portion of said second lumen proximal to said port and both said aperture and the portion of said second lumen dista to said port, and (b) maintain said distal portion of said second lumen in open communication with said first lumen through said aperture and said proximal portion of said second lumen in open communication with said port, whereby said proximal portion of said first lumen and said distal portion of said second lumen may be utilized together to define a gas flow pathway.

4,328,807

OUTPUT PULSE ARTIFACT REJECTION IN DEMAND PACEMAKERS

Thomas L. Jirak, Plymouth, and Frank C. Beert, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 7, 1980, Ser. No. 138,221
Int. Cl.[3] A61N 1/36
U.S. Cl. 128—419 PG 6 Claims



1. A heart pacemaker comprising:

pulse generating means for generating periodic sequential atrial and ventricular electrical stimulation pulses;

terminal means for connecting to patient's heart for delivering atrial and ventricular stimulation pulses from said pulse generating means thereto;

a sensing amplifier for sensing electrical signals indicative of the patient's heartbeat;

demand control means connected to said sensing amplifier and operative for preventing delivery of said stimulating pulses if a heartbeat occurs within a predetermined time interval following a preceding heartbeat;

first switching means operatively connected between said terminal means and said sensing amplifier for selectively passing signals;

a preamplifier having its input connected to receive signals from said first switching means;

second switching means having a signal input connected to the output of said preamplifier and having a control input and a signal output;

a low pass filter connected to the signal output of said second switching means and to the input of said sensing amplifier, said second switching means normally conductive for conveying signals from said preamplifier to said low pass filter;

control means operatively connected for switching said first and second switching means to a nonconductive condition during delivery of an atrial pulse and for causing said low pass filter to hold a prior signal level at the input of said sensing amplifier; and

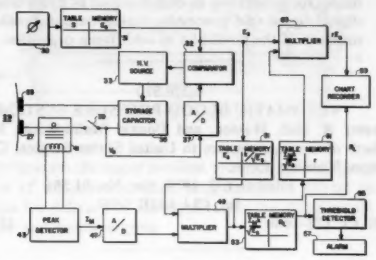
bias means connected for coupling transient artifacts from the output of said preamplifier to the control input of said second switching means, for preventing the transient artifacts from passing through said second switching means to the sensing amplifier during delivery of an atrial pulse.

4,328,808

DEFIBRILLATOR WITH MEANS FOR DETERMINING PATIENT IMPEDANCE AND DELIVERED ENERGY

Francis M. Charbonnier, and Paul V. Long, both of McMinnville, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 9, 1980, Ser. No. 195,558
Int. Cl.[3] A61N 1/36
U.S. Cl. 128—419 D 14 Claims



1. Patient defibrillator apparatus comprising:

means for storing high voltage patient defibrillation energy;

patient electrode means coupled to said energy storage means for applying a defibrillation shock pulse to a patient;

first means coupled to said energy storage means for determining the magnitude of stored defibrillation energy to be applied to said patient electrode means;

second means coupled to said electrode means for sensing and holding the magnitude of the peak current applied to a patient during a defibrillation shock pulse;

third means coupled to said first means and said second means for determining the actual transthoracic resistance of a patient being defibrillated, in response to the magnitudes of stored defibrillation energy and peak current; and

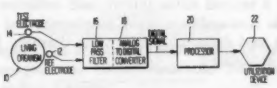
fourth means coupled to said first means and said third means for determining the proportion of said stored defibrillation energy actually delivered to a patient during defibrillation.

4,328,809

DEVICE AND METHOD FOR DETECTING THE POTENTIAL LEVEL OF THE ELECTROMAGNETIC FIELD OF A LIVING ORGANISM

Barry H. Hirschowitz, Box Nine, Brooklandville, Md. 21022, and Kwok-Leung Li, Towson, Md., assignors to Barry Herbert Hirschowitz, Brooklandville, Md.

Continuation-in-part of Ser. No. 726,197, Sep. 24, 1976, abandoned. This application Jun. 26, 1979, Ser. No. 52,258
Int. Cl.[3] A61B 5/00
U.S. Cl. 128—653 39 Claims



1. Apparatus for measuring the condition of a living organism as a function of the electrical potential of an electromagnetic field present in said living organism between a reference location and a test location of said living organism, said apparatus comprising:

reference electrode means and test electrode means electrically contactable with the surface of a living organism at relatively spaced apart locations for detecting the electrical potential of the electromagnetic field of said organism between said test location and said reference location;

analog-to-digital converter means coupled to said reference and test electrode means for generating a digital signal as a function of the electrical potential detected by said electrode means; and

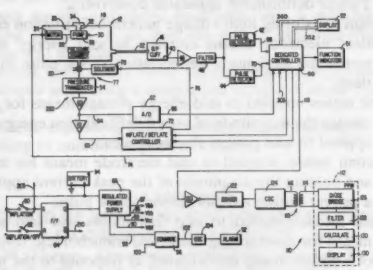
processing means coupled to said analog-to-digital converter means for generating an output signal as a function of said digital signal said processing means output signal being a measure of the condition of said living organism.

4,328,810

AUTOMATIC BLOOD PRESSURE SYSTEM

Jeremy R. Hill, Weston, and Donald Malinouskas, Monroe, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 3, 1979, Ser. No. 81,551
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—680 **15 Claims**



1. A blood pressure system cycling through an inflation cycle and a deflation cycle during which systolic and diastolic pressure in a patient is automatically measured, said system comprising:

blood pressure cuff means, adapted for use about a limb of the patient and capable of being inflated to occlude the artery of the limb;

control means for issuing a plurality of commands;

first means responsive to a first one of said commands for inflating said cuff means during said inflation cycle;

second means responsive to a second one of said commands for deflating said cuff means during said deflation cycle;

means for continuously monitoring K-sound activity in said artery during both said inflation and deflation cycles;

means responsive to a third one of said commands for detecting systolic and diastolic pressure during said deflation cycle;

means for producing a variable threshold voltage; and

means for comparing said monitored K-sound activity with said variable threshold voltage to produce a data signal representative of K-sound activity in said artery, said threshold voltage being a first value during said inflation cycle, a second value during said deflation cycle while systolic K-sounds are being monitored, and a third value during said deflation cycle while diastolic K-sounds are being monitored.

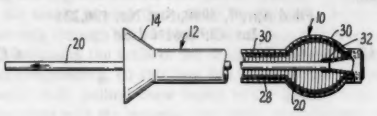
4,328,811

CALIBRATING DILATION CATHETER

Thomas J. Fogarty, 770 Welch Rd., Palo Alto, Calif. 94304

Filed Jul. 28, 1980, Ser. No. 172,764
Int. Cl.³ A61M *29/02*
U.S. Cl. 128—774 **4 Claims**

1. A catheter for dilating a partially occluded section of a blood vessel and for calibrating the internal diameter of the dilated section, said catheter comprising a flexible hollow shaft, laterally expansible and retractable balloon means carried by said shaft at the distal end thereof, and an enlarged and normally incompressible calibrator oval of a predetermined



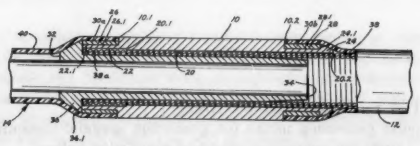
diameter carried by said shaft in adjacent relation to the proximal end of said balloon means for the calibration of the internal diameter of said occluded section after said section has been dilated by lateral expansion of said balloon means and said balloon means has been laterally retracted.

4,328,812

RING ELECTRODE FOR PACING LEAD

Keith A. Ufford, Maple Grove, and Edward G. O'Neill, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 21, 1980, Ser. No. 133,371
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—786 **21 Claims**



1. A body-implantable lead comprising a length of conductor having proximal and distal ends; connector means coupled to said proximal end of said conductor; electrode means coupled to said distal end of the conductor and tubular insulating means surrounding said conductor between exposed portions of said electrode means and said connector means; wherein said electrode means further comprises a cylindrical, tubular conductor member having an outer cylindrical surface; and circumferential channel at an end of said member recessed into said outer cylindrical surface to a predetermined depth; a hook incuding a hook edge on a proximal end of said member for engaging said tubular insulating means; an elastic band of insulating material fitting within said circumferential channel; and means for bonding a terminal portion of said insulating means to said elastic band, the combined thickness of said elastic band, said bonding means and said insulation means being equal to said predetermined depth whereby a smooth uninterrupted surface is presented at the interface of said electrode means and said insulating means.

4,328,813

BRAIN LEAD ANCHORING SYSTEM

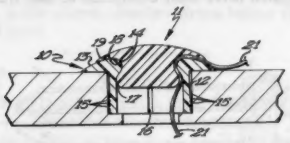
Charles D. Ray, Wayzata, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 20, 1980, Ser. No. 199,014
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—791 **17 Claims**

1. A system for anchoring a brain lead within a cranial burr hole while closing that hole which comprises:

socket means including an aperture defining a lead passage and means for engaging a cranial burr hole to secure said

socket means to the cranium with said passage in general alignment with said burr hole; and



plug means configured to cooperate with said socket means aperture for mutual engagement of a lead within said aperture while closing said aperture.

4,328,814

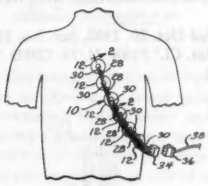
PRECORDIAL ECG STRIP

Edward J. Arkans, Schaumburg, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 4, 1980, Ser. No. 156,245

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—640 **3 Claims**



1. An ECG strip, comprising:

six electrode assemblies, each electrode assembly comprising a circular one-piece foam pad housing with an upper surface and a flat, uniplanar base or skin contacting surface, means defining a cylindrical recess centrally within but only partially through said foam pad, said recess opening onto said skin contacting surface, a conductive gel filling said recess, and an electrode at the upper end of said recess, and having a portion extending upwardly through and protruding from said foam pad upper surface;

means flexibly interconnecting said six electrode assemblies together in a row comprising five separate individual, relatively thin strips of flexible material having a width substantially less than the width of each housing, each strip interconnecting adjacent electrode assemblies together; and

a bundle of six conductive leads extending along the six electrode assemblies in a row and having respective first ends releasably connected to the six electrode assembly protruding electrode portions, respectively, and having second ends attached to a plug connector adjacent one end of the ECG strip.

4,328,815

DIVIDER FEED MEANS FOR AXIAL FLOW COMBINE

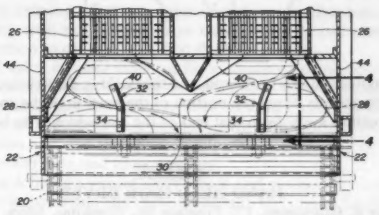
E. William Rowland-Hill, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Apr. 6, 1981, Ser. No. 251,573

Int. Cl.³ A01F *12/10*

U.S. Cl. 130—27 T **7 Claims**

1. An axial flow combine comprising a header having a material elevating conveyor extending upwardly and rearwardly to the forward end of a feeder house in which at least one rotor coacts with a concave grate to effect threshing of the material, an auger on the forward end of the rotor, and a stationary ramp beneath the auger to support the material for movement between the elevating conveyor and the auger and rotor and concave grate, in combination with vane means connected to said ramp beneath the auger and extending generally longitudinally of the feed path of material from said elevating conveyor to said auger and operable to divide the material and form the same somewhat into a partial layer moving longi-



tudinally beneath the auger incident to the auger changing the direction of the material from longitudinal to lateral spiral directions for delivery of the material for threshing action by said rotor and concave grate.

4,328,816

PROCESS FOR IMPROVING THE FILL POWER OF RECONSTITUTED TOBACCO

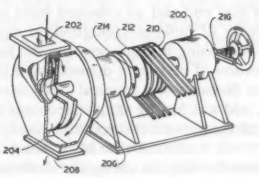
Philip H. Coghill, II, Pineville, N.C., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 47,453, Jun. 11, 1979, Pat. No. 4,258,728.

This application Oct. 31, 1980, Ser. No. 202,537

Int. Cl.³ A24B *3/00*

U.S. Cl. 131—305 **5 Claims**



1. A system for improving the fill power of reconstituted tobacco comprising: means for wrinkling reconstituted tobacco; means to feed the wrinkled tobacco to a disc mill; the disc mill including a pair of spaced discs of from about 12 to 48 inches in diameter therein, one of said discs being rotatable, the other of said discs being stationary, the spacing between said discs being from about 0.050 to 0.100 inches; means to rotate said rotatable disc at from 800 to 1300 revolutions per minute; feed means for said disc mill; discharge means from said disc mill; and, air-veying means in flow communication with the discharge means of said disc mill to tobacco separating means, said tobacco separating means including means to segregate the tobacco into different particle size ranges.

4,328,817

SMOKING ARTICLES

Donald B. Naylor, and Richard R. Baker, both of Southampton, England, assignors to British-American Tobacco Company Limited, London, England

Filed Oct. 3, 1980, Ser. No. 193,747

Claims priority, application United Kingdom, Oct. 26, 1979, 7937170

Int. Cl.³ A24D *1/00*; A24C *5/00*

U.S. Cl. 131—360 **5 Claims**

1. A smoking article comprising a rod of smoking material wrapped in a wrapper, the packing density of said smoking material varying continuously along at least a major portion of

the overall length of the rod, but being constant across any section, within said portion, in a plane perpendicular to the

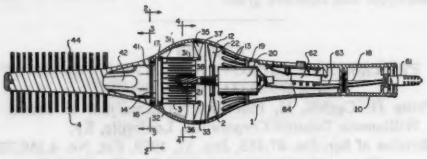
longitudinal axis of the rod, and the packing density decreasing continuously along the portion of the portion of the rod in the direction away from that end of the rod which is to be lit.

4,328,818

HAND HELD HAIR DRYER

Dov Z. Glucksman, 175 Freeman St., Brookline, Mass. 02146

Filed Apr. 27, 1976, Ser. No. 680,697
Int. Cl.³ A45D *20/00*
U.S. Cl. 132—9 **4 Claims**



1. A domestic hair dryer of the type adapted to have a hair brush attached thereto comprising in combination a casing of circular transverse cross-section having a tubular handle portion at its rear end and an enlarged front portion, said front portion being of bulbous configuration and having its wall gradually increasing in diameter from the handle portion to a central portion of maximum diameter and then gradually decreasing in diameter to a terminal end portion constituting an air outlet, said wall having air inlet openings therein distributed about the circumference thereof immediately in advance of the handle portion; a motor driven fan of the axial flow propellor type supported within the casing, the diameter of said fan being commensurate with the diameter of the casing immediately rearwards of the wall portion of largest diameter; a heating element in the shape of a hollow cylindrical cage of parallel angularly positioned guide vanes, said guide vanes being adapted to be electrically energized and heated, said cage having an outer diameter less than that of said fan and an inner diameter substantially equal to the inner diameter of said air outlet; supporting means for said cage positioning the same within said casing between said fan and said air outlet, said supporting means including means directly connecting one end of said cage to said casing wall adjacent said air outlet; and electrical connections and switching means for selectively energizing one or both of said motor driven fan and said heating element, whereby air drawn into said casing is directed by said fan to be guided by said casing wall to flow into and through said cage from the outer side thereof and to leave said outlet in unimpeded flow from the interior of said cage.

4,328,819

VIBRATING NAIL TRIMMER

Everett L. Haas, #73 Wellington Dr., Middlebrook, Bristol, Tenn. 37620

Filed Dec. 3, 1980, Ser. No. 212,590
Int. Cl.³ A45D *29/05*
U.S. Cl. 132—73.6 **7 Claims**

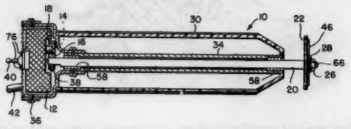
1. An electrically powered nail trimmer comprising:

a source of electrical power;

a motor connected to said source of electrical power, said motor means having a rotatable drive shaft;

transfer means connected to said rotatable drive shaft for producing vibratory motion;

an elongated drive shaft connected to said transfer means; and



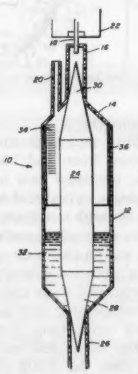
a blade connected to said elongated drive shaft, said blade having a surface capable of severing a nail as it moves back and forth across the top of the nail surface, whereby said blade vibrates across a surface to be trimmed, thereby severing a portion of the surface.

4,328,820

CONSTANT-FLOW REGULATOR FOR GRAVITY-FED LIQUIDS

Juan R. Serur, 546 Commonwealth Ave., Newton Center, Mass. 02159

Filed Oct. 20, 1980, Ser. No. 199,075
Int. Cl.³ F16K *21/18*; G05D *7/01*
U.S. Cl. 137—2 **11 Claims**



7. In a method of providing a constant-flow regulation of a liquid from a gravity-assisted source, employing a flow regulator which comprises:

(a) a single closed chamber adapted to contain a liquid which is to be delivered at a controlled rate;

(b) a vent means in the upper portion of the chamber, having a communication between the atmosphere and the interior of the closed chamber;

(c) a centrally disposed inlet in the upper portion of the closed chamber and an opposite centrally disposed outlet in the lower portion of the closed chamber; and

(d) a float valve disposed within the closed chamber, said closed chamber having upper and lower sections that are so positioned to seal the float valve against the upper inlet and the lower outlet when the liquid from the gravity-assisted source is not being delivered to the closed chamber, the improvement which comprises:

adjusting the longitudinal length of the upper and lower sections of the closed chamber relative to each other, to allow movement of the float valve within the closed chamber to provide the desired flow rate of the liquid from the gravity-assisted source and to maintain a desired liquid level in the closed chamber, said float valve

may seal the upper inlet when the liquid level in the closed chamber exceeds the desired liquid level and said float valve may seal the lower outlet when the liquid level in the closed chamber drops below the desired liquid level

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4,328,821

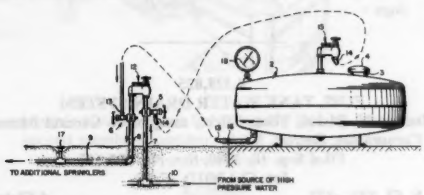
METHOD AND APPARATUS FOR THE CHEMICAL TREATMENT OF PLANTS

Robert H. Silver, 5913 Hillview Park, Van Nuys, Calif. 91401

Continuation-in-part of Ser. No. 965,949, Dec. 4, 1978, abandoned. This application May 27, 1980, Ser. No. 153,721

Int. Cl.³ F16K *19/00*

U.S. Cl. 137—7 **5 Claims**



3. A method for dispersing chemicals in liquid form from a tank to plants using an existing irrigation system of the type that includes a pre-existing shutoff valve and an antisiphon valve, said tank having a pressure gauge, and having a throttling valve, said method comprising the steps of connecting said tank to the low and high pressure side of said pre-existing shutoff valve and antisiphon valve with an inlet on said tank connected to said low pressure side and an outlet on said tank connected to said high pressure side, filling the tank to a desired level with said chemical, back filling the tank with water from the low pressure side of said pre-existing shutoff valve and antisiphon valve, noting the low pressure on said gauge and opening the throttling valve to increase the tank pressure a predetermined amount so that the chemicals in the tank are forced into the existing irrigation system at the low pressure outlet side of said shutoff valve and antisiphon valve as water from the high pressure side of said shutoff valve and antisiphon valve flushes the tank through the throttling valve on the tank at the outlet thereof whereby the rate at which chemical is dispersed is set by adjusting only one valve.

4,328,822

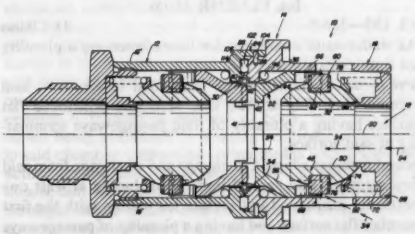
BREAKAWAY COUPLING ASSEMBLY

Raymond L. Wilhelm, Trabuco Canyon, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 15, 1980, Ser. No. 112,166

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—68 R **24 Claims**



1. A breakaway valve fitting comprising:

housing means defining a passage therein;

breakaway means connecting said housing means to conduit means;

poppet valve means mounted for axial movement within said housing means between open and closed positions, said poppet valve means defining a first axial fluid flow path about the perimeter thereof when in said open position;

means defining a first valve seat in said passage and cooperating with said poppet valve means when in said closed position to obstruct said first fluid flow path;

a ball valve member mounted for axial and rotational movement within said housing means between open and closed positions, said ball valve member including a central bore which defines in conjunction with said poppet valve means a second axial fluid flow path when said ball valve member is in said open position;

means defining a second valve seat in said passage and cooperating with said ball valve member in said closed position to obstruct said second fluid flow path;

means interconnecting said poppet valve means and said ball valve member for permitting simultaneous axial and rotational movement of said ball valve member relative to said poppet valve means when moving from said open to said closed positions to thereby engage said ball valve member against said second valve seat and obstruct said second fluid flow path;

expandable circumferential means for releasably retaining said ball valve member in said open position;

compression spring means for biasing said poppet valve means and said ball valve member, respectively, toward said first and second valve seats; and

valve operating means for sensing the connection of said housing means to said conduit means and controlling the operation of said poppet valve means and said expandable circumferential retaining means by permitting said poppet valve means to axially move to said closed position and said expandable circumferential retaining means to release said ball valve member to obstruct said fluid flow paths upon activation of said breakaway means.

4,328,823

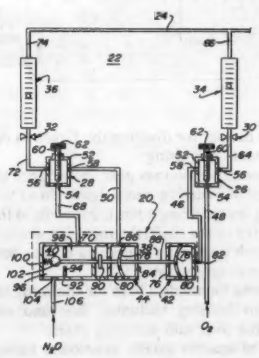
OXYGEN FLOW RATIO CONTROLLER FOR ANESTHESIA APPARATUS

Peter J. Schreiber, Zionsville, Pa., assignor to N.A.D. Inc., Telford, Pa.

Filed May 14, 1980, Ser. No. 149,874

Int. Cl.³ G05D *11/03*

U.S. Cl. 137—88 **6 Claims**



1. A gas control system for use with anesthesia apparatus supplying oxygen through one line into a manifold while supplying an anesthesia gas through a second line into the manifold, said first line including first adjustable means for enabling the adjustment of the flow of oxygen through said first line,

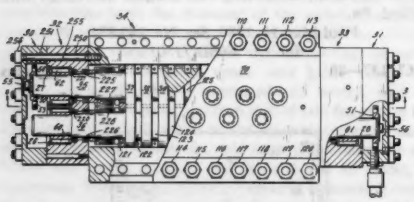
said second line including second adjustable means for enabling the adjustment of the flow of anesthesia gas through said second line, said first and second adjustable means being adjustable independently of each other, said system comprising flow control means coupled to said second line and capable of being fully open, partially open, or closed for controlling the flow of gas through said second line, first pressure actuated monitoring means responsive to oxygen pressure in said first line for providing a first pressure signal representative of oxygen flow, second pressure actuated monitoring means responsive to anesthesia gas pressure in said second line for providing a second pressure signal representative of said anesthesia gas flow, and means responsive to said pressure signals from first and second pressure actuated monitoring means for operating said flow control means in response to the differential pressure monitored by said first and second pressure actuated monitoring means, whereupon whenever the flow of oxygen drops below a first predetermined minimum level said flow control means closes to stop the flow of anesthesia gas into said manifold, whenever the ratio of the flow of oxygen to the flow of anesthesia gas is above a second predetermined level and the flow of oxygen is above said first predetermined minimum level said flow control means opens fully to permit said gases to flow into said manifold in the ratio as established by said first and second adjustable means, and whenever the ratio of the flow of oxygen to the flow of anesthesia gas reaches said second predetermined level and the flow of oxygen is above said first predetermined level said flow control means opens partially to a position to adjust the flow of anesthesia gas to maintain said second predetermined level.

4,328,824

FLOW DIVIDER WITH PLURAL METERING GEARS, UNRESTRAINED SPACERS THERE-BETWEEN AND LUBRICATED END ROLLER BEARINGS

James G. Kiernan, Albany, N.Y., and James G. Leonard, Hendersonville, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 10, 1979, Ser. No. 101,532
Int. Cl.³ G05D *11/03*; F01C *11/00*
U.S. Cl. 137—99 **7 Claims**



1. In a flow divider for dividing the flow of a common fluid, the improvement comprising:

first and second continuous gear shafts, each shaft carrying a plurality of metering gears rigidly fixed to the shaft for rendering the metering gears immovable in the axial direction relative to the shaft, the metering gears on each shaft mating with corresponding gears on the other shaft and forming mating gear sets;

a main housing including a bore for enclosing said shafts and gears, said housing including first and second halves which close over said metering gears;

a plurality of spacers axially positioned between adjacent gear sets and free to move in the axial direction in the bore of said housing while being in fluid sealing arrangement with said shaft;

a common fluid input connected to said housing and adapted to supply said common fluid to said metering gears;

a plurality of fluid outlets connected to said housing and adapted to supply a metered amount of said common fluid from each of said metering gears;

first and second bearing housings abutting each end of said main housing, said bearing housings including respective roller bearings supporting each end of each said gear shafts, the bearings in said first housing being fixed in an axial location relative to said shafts and the bearings in said second housing being free to move axially therein; and

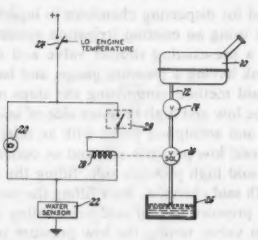
means for lubricating each of said roller bearings, said means for lubricating being isolated from said common fluid being metered, whereby said flow divider is characterized by its ability to withstand sudden thermal excursions in temperature of the common fluid without experiencing binding or seizing of said gear shafts or said roller bearings.

4,328,825

FUEL TANK WATER DRAIN SYSTEM

Macram N. Bishai, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 10, 1980, Ser. No. 185,627
Int. Cl.³ B01D *17/02*
U.S. Cl. 137—172 **4 Claims**



1. A water drain system for a vehicle fuel tank, said system comprising a sensor activated by the presence of water in the fuel tank, a sensor activated when the fuel tank has been quiescent for a period sufficient to assure separation of water from fuel in the tank, a drain valve, and a solenoid energized in response to activation of both said sensors for opening said drain valve to permit draining of water from the fuel tank.

4,328,826

UNDERWATER FLUID CONNECTOR

Hollis A. Baugh, Hempstead, Tex., assignor to Koomey, Inc., Houston, Tex.

Filed Oct. 30, 1980, Ser. No. 202,086
Int. Cl.³ E21B *33/06*
U.S. Cl. 137—236 S **11 Claims**

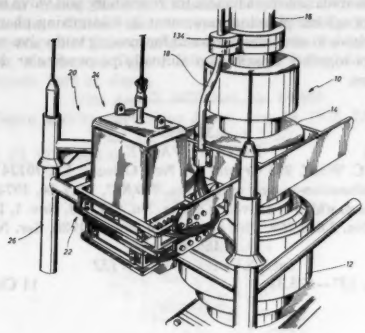
1. An underwater connector for interconnecting a plurality of fluid lines comprising,

a first member adapted to be positioned underwater, said member including at least one vertically positioned flat surface having a plurality of fluid passageways terminating at said surface,

a second member adapted to engage and disengage from said first member, said second member including at least one vertically positioned flat surface for mating with the first member flat surface and having a plurality of passageways terminating at said second member flat surface for sealingly mating with the first member passageways,

coating cam means between said first and second members for horizontally moving the first and second member

together in a sealing relationship as they move vertically together, and



releasable locking means for releasably locking the first and second members together.

4,328,827

VALVE WITH AN AUTOMATIC BLEED DEVICE

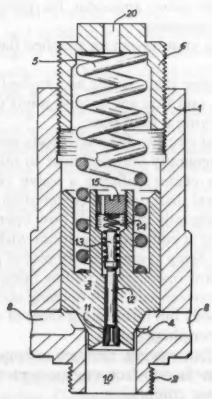
Hubert Enjolras, Domene, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 26, 1980, Ser. No. 163,070

Claims priority, application France, Jun. 28, 1979, 79 16738

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—512.2 **1 Claim**



1. A safety valve for an incompressible fluid-containing enclosure, comprising a longitudinal body fixed to the wall of such enclosure, an internal valve chamber with valve member means sliding within said chamber, an inlet in said body connected to the interior of said chamber and forming a seat for said valve member, with two openings in said body, said first opening being located adjacent the valve seat, while the other opening is located on far end of body, said valve member means being positioned in abutting relationship with said seat in said chamber, calibrating spring means within said chamber acting against said valve member at one end of said spring means, said valve-member being provided with a nozzle therethrough, needle means located within an annular cylindrical cavity within said valve body, said needle being firmly applied against said nozzle by a piston abutting against said needle, a balancing spring means positioned to press on piston screw means for adjusting the force of said balancing spring, said needle defining with said cylindrical cavity an annular clearance of constant cross-section and valve member forming a calibrated orifice or port.

4,328,828

DRAINAGE SYSTEM WITH VENT

James P. Cianci, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 17, 1980, Ser. No. 187,909

Int. Cl.³ F16K *31/00*; A61J *1/00*; A61M *27/00*

U.S. Cl. 137—549 **10 Claims**

1. Vent means in a urine drainage system, comprising:

a conduit having a lumen for drainage of urine and an opening in a wall of the conduit communicating with said lumen;

a housing defining passageway means communicating with said opening;

a plug received in the opening inside said housing, said plug being movable between a first outer closed position with the plug sealingly engaged in said opening and closing the opening to prevent passage of urine through the opening, and a second inner open position with the plug permitting passage of air through the opening between the passageway means and the lumen;

a filter in the housing pervious to air and substantially impervious to the passage of bacteria, said filter closing said passageway means to the atmosphere to filter air passing from the atmosphere to the passageway means, said housing having a conduit section defining a portion of said conduit containing said opening.

4,328,829

UNIVERSAL MODULE FOR PNEUMATIC FIXED-CYCLE CONTROL

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Neckor, Fed. Rep. of Germany

Filed Aug. 12, 1980, Ser. No. 177,343

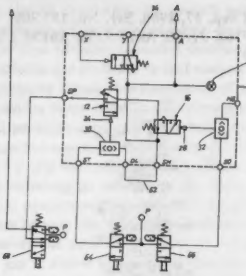
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1979, 2932807

Int. Cl.³ F16K *11/10*

U.S. Cl. 137—624.11 **4 Claims**

1. In a universal module for a pneumatic fixed-cycle control, said module incorporating a bistable storage circuit having a first two-position valve, said valve having an input opening connected to an operating-pressure source, said valve having a servo-motor operable to shift the valve slide and connected to a start connecting opening of the bistable storage circuit, said first valve being actuable to provide an output pressure from which there is derived an activating signal for a load associated with the module, a second two-position valve acting as an AND-member, which AND-member has an input opening which is loaded with said activating signal and a valve slide servomotor which is loaded with a repeating signal, and a two-way valve acting as an OR-member and the two inputs of which are connected to stop connecting openings of the module and the output side of which is connected to a stop connect-

ing opening of the bistable storage circuit, the improvement being comprised in that said first two-position valve of the bistable storage circuit is initially biased under the force of a spring to its closing position, said servomotor of said first two-position valve is connected through a second two-way valve to the start connecting opening of the bistable storage



circuit and the output of a third two-position valve, said third two-position valve having a valve slide initially biased by a spring into its pass position, said third two-position valve having an input connected to the output of the first two-position valve, and an output which makes available said activating signal and a servomotor connected to said stop connecting opening of the bistable storage circuit.

4,328,830

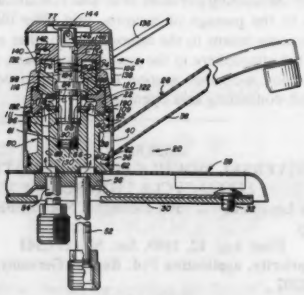
FLUID MIXING VALVE

Larry G. Greer, LaFayette, Ind., assignor to Globe Valve Corporation, Delphi, Ind.

Filed Jan. 25, 1980, Ser. No. 115,424

Int. Cl.³ F16K *11/06*

U.S. Cl. 137—625.4 **20 Claims**



14. A fluid mixing valve adapted to be actuated by a handle, said valve comprising:

a valve body, said valve body defining therein (a) a mixing chamber, (b) an outlet passage communicating between said mixing chamber and the exterior of said valve body, (c) two inlet passages, each inlet passage communicating with the exterior of said valve body, and (d) a pair of valve seats spaced apart in parallel planes, each seat defining an inlet port to said mixing chamber for one of said inlet passages;

a pair of spaced-apart valve members, each valve member disposed against and adapted to slide relative to one of said seats in two mutually perpendicular directions in a plane of movement extending parallel to said seats, each valve member defining an orifice therethrough and each valve member being movable so that its associated orifice can be moved into and out of alignment with one of said inlet ports; and

means actuatable by a handle for restraining said valve members against pivoting movement in said mixing chamber relative to said inlet ports and for moving said valve members together in said two mutually perpendicular directions.

4,328,831

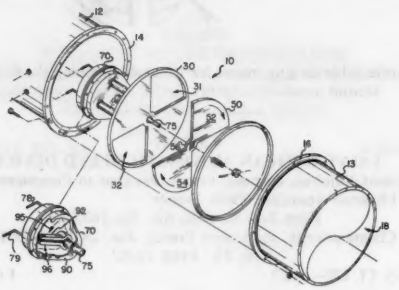
ROTARY VALVE

Robert C. Wolff, 955 Crystal St., New Orleans, La. 70124

Continuation-in-part of Ser. No. 469,807, May 14, 1974, abandoned, which is a division of Ser. No. 411,848, Nov. 1, 1973, Pat. No. 3,883,269. This application Jun. 6, 1980, Ser. No. 156,918

Int. Cl.³ F16K *3/08, 31/122*

U.S. Cl. 137—625.31 **11 Claims**



8. A rotary disc valve apparatus for placement between pipeline flanges comprising:

a. a first pipeline joint having an attached flange connection member;

b. a second pipeline joint having an attached flange connection member, said first and second joints defining a pipeline bore carrying a fluid flow;

c. a generally flat circular disc valve body mounted between said flanges generally perpendicular to said pipeline bore and having a center defining a valve central axis and having a central shaft opening centered on said axis, and a plurality of generally pie-shaped flow openings, said flow openings being at equi-radial positions with respect to one another, each being symmetrically placed about said axis, each of said flow openings providing linear edges projecting radially between said shaft opening and the peripheral edge of said body but terminating short of said shaft opening and said peripheral edge;

d. a generally flat valving member mounted against said valve body in face-to-face engagement therewith, said valving member comprising:

i. a central hub having a shaft opening therethrough;

ii. a pair of pie-shaped valving members, connected to said hub, each of said valving members having a circular peripheral outer edge and a pair of straight side edge portions defining radial lines from the central hub of said valving member to said peripheral edge portion;

e. a common operator shaft passing through said valve body shaft opening and said valving member hub shaft opening and being keyed to said valving member for rotation therewith, said valve body, said common shaft and said valving member all defining a common central axis coincident with said central pipeline bore axis with said common shaft entirely disposed within said pipeline bore; and

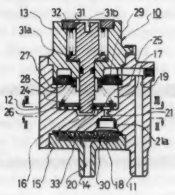
f. pneumatically operative operator means connected at least in part to said shaft and positioned within the fluid flow stream being valved, and anchored to said body for rotating said shaft and said valving member between desired angular positions.

4,328,832

MULTIPLE THROTTLE LEVEL ORIFICE APPARATUS

Masami Inada, Kariya; Kazuhiko Kitamura, Toyota; Shuji Okumura, Oubu; Takao Nonoyama, and Riichi Tsuji, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 7, 1979, Ser. No. 64,605
Claims priority, application Japan, Aug. 10, 1978, 53-98086
Int. Cl.³ F16K 5/14, 5/10
U.S. Cl. 137—625.46 5 Claims



1. A multiple throttle level orifice apparatus comprising a body, an isolation wall which divides the interior of the body into first and second chambers, a plurality of orifice passages formed in the isolation wall in parallel relationship with each other so as to provide communication between said chambers, a throttle control member for selectively opening and closing said orifice passages, and a regulating member for selectively operating the control member to select an orifice passage to provide said communication between the chambers; said throttle control member comprising a rotatable plate secured to said regulating member and having a communication port formed therein, and a seal member bonded to the rotatable plate's surface facing said isolation wall and having therein a plurality of large openings of larger diameter than said orifice passages; said communication port being located within the extent of one of said openings in said seal member; said apparatus further comprising spring means normally urging said seal member into engagement with said isolation wall so that said openings surround and seal said orifice passages; said regulating member comprising means for disengaging said seal member from said isolation wall and for unsealing said openings from said orifice passages; said body comprising a cover having tapered radial recesses therein, and said disengaging means having tapered radial projections which are received in said recesses whereby, when said rotatable plate is rotated, said seal member is lifted and disengaged from said isolation wall.

4,328,833

MULTI-PORTED VALVE WITH SEALING NETWORK BETWEEN VALVE BODY AND ROTOR

William B. Aurther, Cucamonga, Calif., assignor to Purex Corporation, Lakewood, Calif.

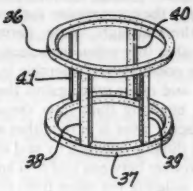
Filed Sep. 29, 1980, Ser. No. 191,704
Int. Cl.³ F16K 11/085
U.S. Cl. 137—625.47 4 Claims

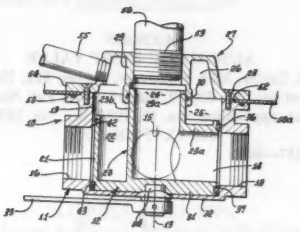
1. In a valve having a body containing three ports, and a rotor rotatable in the body, the rotor rotatable about an axis to bring two passages in the rotor selectively into and out of registration with the body ports, the body ports opening at a cylindrical bore in the body, and the rotor passages opening at a cylindrical periphery of the rotor, the rotor passages spaced about said axis, the combination with said valve of:

(a) axially spaced seal rings extending about said axis between the rotor and the body, the rings spaced at axially opposite sides of the passages and ports,

(b) at least three seal strands extending between said rings and integral therewith, first and second strands spaced apart about said axis at angularly opposite sides of one of said rotor passages, and the second strand and a third strand spaced apart about said axis at angularly opposite sides of the second of said rotor passages,

(c) said seal rings and seal strands being carried by the rotor





which contains grooving corresponding in location with and receiving said seal rings strands,

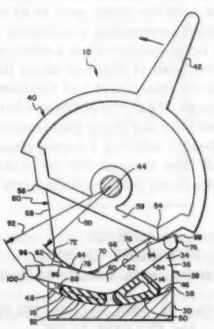
(d) the rotor having a wall and certain of said strands having local attachment to the rotor via apertures in said wall.

4,328,834

PINCH VALVE

Ronald W. Oates, Sr., Chalfont, and John C. Fagan, Philadelphia, both of Pa., assignors to SCM Corporation, New York, N.Y.

Filed Aug. 27, 1980, Ser. No. 181,578
Int. Cl.³ F16K 11/18; F16L 55/14
U.S. Cl. 137—636.1 11 Claims



1. A pinch valve assembly for selectably controlling fluid flow through one of two resiliently deformable tubes, the pinch valve including a body member having a first wall joined in spaced relation to a second wall by a singular compression surface to define a recess in the body member, the compression surface supporting both of the tubes, and a selector lever mounted on the body member for movement between two selectable positions, the improved pinch valve comprising:

a unitary abutment integrally formed from the selector lever

extending within the recess towards the compression surface; and

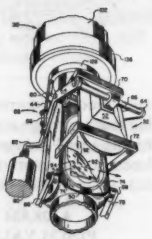
a rocker supported on the tubes and located within the recess intermediate the compression surface and said abutment, said rocker operable in a first position for pinching one tube against the compression surface thereby blocking fluid flow therethrough while permitting fluid flow through the other tube when the selector lever is in one of the selectable positions and operable in a second position for pinching said other tube against the compression surface thereby blocking fluid flow through said one tube when the selector lever is in the other selectable position, said rocker is slidably engaged by said abutment for movement of said rocker between said first and second operable positions for isolating the tubes from sliding contact with said abutment thereby preventing frictional wear of the tubes.

4,328,835

AUTOMATIC DUMP VALVE

Donald F. Taylor, 3555 Vancouver, Dallas, Tex. 75229

Division of Ser. No. 58,927, Jul. 19, 1979, Pat. No. 4,300,585.
This application Sep. 15, 1980, Ser. No. 187,424
Int. Cl.³ F16K *11/14*
U.S. Cl. 137—869 **5 Claims**



1. In a dump valve of the type including an elongated tubular housing defining a longitudinally extending flow passage and having a sidewall including an opening defining a dump port in communication with the flow passage, and a cover plate mounted on the housing for movement from a position of sealing engagement with the dump port to an open port position, the improvement comprising a deflector plate mounted within the housing for movement from a clear passage position wherein the deflector plate is disposed along the sidewall and substantially across the dump port and retracted substantially out of the flow passage to a dump position wherein the deflector plate is extended from the dump port transversely through the flow passage thereby defining a bypass channel for diverting substantially all flow through the valve out through the dump port when the cover plate is in the open port position.

4,328,836

PRESSURE VESSEL

Ivan L. Petrie, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 14, 1980, Ser. No. 196,898
Int. Cl.³ F16L *55/04*
U.S. Cl. 138—30 **7 Claims**

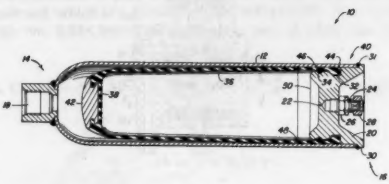
1. A pressure vessel comprising:

(a) a cylindrical housing having a closed end and an open end, said closed end having a port provided therein;

(b) an end cap partially insertable into said open end of said cylindrical housing and fixed thereto by welding and having an axially extending through hole provided therein, an annular shoulder encircling and abutting the open end surface of said housing, and first and second annular grooves formed in the outer periphery thereof, said first annular groove located closer to said annular shoulder than said second annular groove;

(c) valve means disposed in said axially extending through hole for controlling flow of a gas;

(d) a generally cylindrical bladder having a closed end and an open end, said open end having an inwardly projecting annular protuberant disposable in said first annular groove and capable of sealing said bladder to said cylindrical housing, said bladder being fully retained within said cylindrical housing by said end cap, said bladder further having a smooth outer peripheral surface constructed



with a cylindrical section and an elongated annular tapered section which is inclined towards said closed end, said tapered section allowing said bladder to expand uniformly while being filled with a pressurized gas;

(e) sealing means disposed in said second annular groove for sealing said bladder to said end cap, said sealing means distally positioned from a point where said cylindrical and tapered sections come together; and

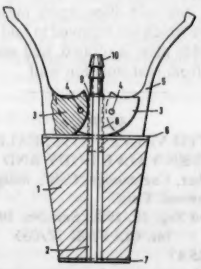
(f) means for securely fastening said end cap to said cylindrical housing to completely close said open end of said cylindrical housing.

4,328,837

APPARATUS FOR MOUNTING A PIPE IN AN OPENING IN A PRESSURE VESSEL WALL

Josef Dagn, Schwendter-Str. 231a, 6345 Kössen (Tirol), Austria

Filed Mar. 18, 1980, Ser. No. 131,463
Claims priority, application Austria, Mar. 26, 1979, 2210/79
Int. Cl.³ F16L *55/10*
U.S. Cl. 138—89 **1 Claim**



1. Apparatus for mounting a pipe in an opening in a pressure vessel wall, comprising:

a plug-like closure body of elastic material, having a perimetrical sidewall extending, frusto-conically tapering fashion, between an outer end and an inner end;

an inner closing plate, said inner closing plate being disposed against said inner end of said plug-like closure body;

an outer closing plate, said outer closing plate being disposed against said outer end of said plug-like closure body;

a pipe having a throughbore extending between an inner end thereof and an outer end thereof;

said pipe being connected adjacent said inner end thereof to

said inner closing plate so as to be open through said inner end plate of said pipe;

said pipe extending axially completely through said plug-like closure body and said outer closing plate and having said outer end thereof disposed substantially axially outwardly beyond where said pipe emerges axially outwardly of said outer closing plate, thus forming an axially outwardly extending portion of said pipe, which portion includes said outer end of said pipe;

tube connector element means formed on said pipe adjacent said outer end thereof;

a band of threading formed externally on said pipe between a level intermediate said ends of said plug-like closure body, and said tube connector element means;

a bearing block threadably mounted on said extending portion of said pipe and normally having an inner end surface adjacent said outer closing plate from the axially outer side of said outer closing plate, so that when said bearing block is reversibly threaded inwardly, said plug-like closure body may be reversibly axially compressed and radially expanded to a desired extent, for adjusting the plug-like closure body to tightly and securely fit in a pressure vessel wall opening, even though such opening may vary in width from a given nominal size;

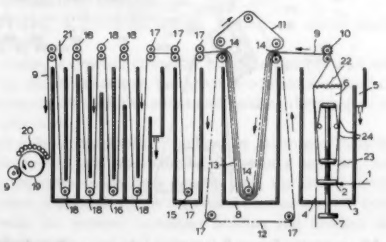
a pair of diametrically opposed eccentric lever means pivotally secured to said bearing block and having respective cam means positioned for confrontingly engaging relation with said outer closing plate, said eccentric lever means each being thereby arranged to be reversibly pivoted in one respective direction to forcibly engage the outer closing plate toward the inner closing plate, thus axially compress and radially expand the plug-like closure body beyond such compression and expansion as may then be being provided by the relative degree of inward threading of the bearing block on said band of threading, and thus reversibly take away from the bearing block a direct responsibility for providing the desired extent of such axial compression and radial expansion of said plug-like closure body.

4,328,838

THICK AND TOUGH CELLOPHANE FOR CASINGS AND METHOD OF PREPARING THE SAME

Kosaku Asada, Toyoda, and Hiroo Maeno, Osaka, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 949,395, Oct. 6, 1978, abandoned. This application May 30, 1979, Ser. No. 43,632
Claims priority, application Japan, Oct. 19, 1977, 52-126030
Int. Cl.³ C08L *1/24;* D01F *2/06;* F16L *11/00*
U.S. Cl. 138—118.1 **8 Claims**



1. In a method of preparation of cellophane for casing wherein viscose is passed through a coagulation solution and then desulfurized, washed and finished, the improvement comprising

a first coagulation bath containing a coagulation solution consisting essentially of as active elements 15 to 30 weight percent middle or higher alcohol having 3 to 12 carbon atoms and/or polyhydric alcohol, 10 to 20 weight percent ammonium salt, and an acid in an amount sufficient to neutralize the reaction solution;

wherein the viscose is passed through said solution and is formed in the shape of a tube, and is stretched in the horizontal direction in an amount of from 5 to 50 percent during the process of coagulation during the passage through said coagulation solution;

a second coagulation bath containing a coagulation solution consisting essentially of as active elements an inorganic acid and metallic salt thereof; and

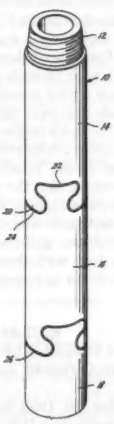
wherein said tube is passed through said second bath after passage through said first bath and after being stretched in said first bath during coagulation thereof, and is further stretched in the horizontal direction during the process of coagulation in the second bath and during passage of said tube through said second coagulation solution, employing an expander of a magnetic system type.

4,328,839

FLEXIBLE DRILL PIPE

William C. Lyons, and Scot L. Scurlock, both of Santa Fe, N. Mex., assignors to Drilling Development, Inc., Houston, Tex.

Filed Sep. 19, 1980, Ser. No. 188,617
Int. Cl.³ D03D *21/00*
U.S. Cl. 138—120 **7 Claims**

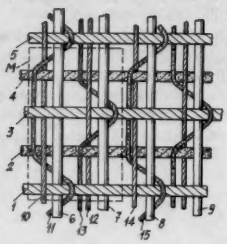


1. A flexible pipe comprising an elongated tubular member subdivided into a plurality of segments of rigid pipe of substantial wall thickness in end to end relationship with a plurality of interlocking teeth and complimentary recesses on each end of the intermediate segments, the teeth of one segment being positioned in the recesses of, and interlocking the teeth of, the adjacent segment with sufficient clearance to form a joint permitting limited relative movement in any direction between the segments, said teeth being generally bell-shaped, each tooth having a substantially flat end portion lying along the circumferential direction of the pipe, with each side of each tooth comprising two reversed, intersecting semicircles, each of said semicircles having a diameter substantially less than the length of said tooth and substantially less than the width of said substantially flat end portion.

4,328,840
DOUBLE SIDE FABRIC

Giulio Fontana, Via Carminati de Brambilla 43, Casatenovo (Como), Italy

Filed Apr. 10, 1980, Ser. No. 139,135
Claims priority, application Italy, Apr. 12, 1979, 21807 A/79
Int. Cl.[3] D03D *19/00*
U.S. Cl. 139—419 7 Claims



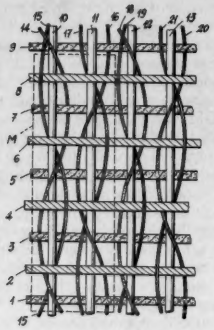
1. A double side fabric comprising of a warp formed of threads of rubbery material and substantially inextensible threads and a weft formed of threads of different nature, parallel to one another and perpendicular to the warp rubbery threads, wherein the weft threads of a first type are arranged at one side of the warp threads, while weft threads of a second type are arranged at the other side of the warp threads, the weft threads of the first type are alternated to the weft threads of the second type, said inextensible warp threads form binding threads substantially parallel to the rubbery threads and leno warp threads, respectively, with one binding thread and one leno warp thread positioned between two adjacent rubbery threads, and wherein each of the binding threads first pass over a first and a second weft thread, then through the fabric to pass under a third and a fourth weft thread, then to pass again above the pair of the next weft threads and so on, and wherein on considering the same above mentioned weft threads, each of the leno warp threads pass over the first weft thread remaining at the other side of the warp rubber thread with respect to that part at which the above considered binding thread is located, then the leno warp thread returns to the same part of the binding thread passing under the rubbery thread, under said binding thread, over the second weft thread, under the third weft thread, over the fourth weft thread, over the above mentioned binding thread and again under the rubbery thread to pass again over the next weft thread, at the other side of the rubbery thread and so on to complete said fabric.

4,328,841
FABRIC WITH DOUBLE LENO WARP THREADS

Giulio Fontana, Via Carminati de Brambilla 43, Casatenovo (Como), Italy

Filed Apr. 10, 1980, Ser. No. 139,136
Claims priority, application Italy, Apr. 12, 1979, 21808 A/79
Int. Cl.[3] D03D *19/00*
U.S. Cl. 139—419 5 Claims

1. A fabric with double leno warp threads comprising a warp including rubbery material threads and binding threads, and a weft comprising upper weft threads and lower weft threads positioned above and respectively below the rubbery warp threads, to which they are substantially perpendicular, wherein the weft threads are bound to one another and to each of the rubbery threads by a lower leno warp thread and by an upper leno warp thread extending through one half turn about each rubbery thread between one binding with the weft and the next, with each of the lower turn binding threads passing over a first lower weft thread, then under and at the other side of the rubbery thread with which it is associated, under a first upper weft thread, over a second lower weft thread, a second upper weft thread and a third lower weft thread, then again under and at the first side of the rubbery thread, under a third upper weft thread, then over a fourth lower weft thread, a fourth upper weft thread and finally again over a new lower weft thread and so on, and with each upper turn binding thread passing over the first lower weft thread, over and at the other side over the rubbery thread, under the first upper weft thread,

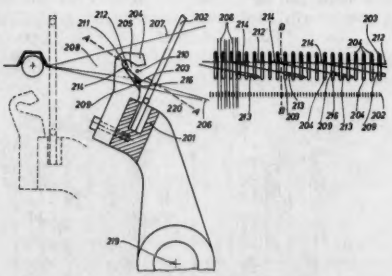


under the second lower weft thread, under the second upper weft thread, over and again at the first side of the rubbery thread, over the third lower weft thread, under the third upper weft thread, under the fourth lower weft thread, under the fourth upper weft thread, and again over the next lower weft thread and rubbery thread and so on to complete said fabric.

4,328,842
APPARATUS FOR WEFT INSERTION IN A WEAVING LOOM

Walter Scheffel, Hopfenstrasse 14, D 8832 Weissenburg, Fed. Rep. of Germany

Continuation of Ser. No. 772,834, Feb. 28, 1977, Pat. No. 4,183,382. This application Sep. 24, 1979, Ser. No. 78,296
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608030; May 19, 1976, 2622148; Jun. 18, 1976, 2627391
The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.
Int. Cl.[3] D03D *47/30*
U.S. Cl. 139—435 6 Claims



1. An apparatus for weft insertion into successive sheds of a loom by means of a fluid, typically a gaseous fluid, by guidance and driving of weft threads through a comb having a channel which includes a main axis and is formed in passage means of a plurality of laminas carried by a slay, therebeing laminas having nozzles and laminas without nozzles, the comb being located at the fabric side of the reed, means for rocking said comb and reed, the passage means of each lamina opening on the reed side forming a channel which is tapered inwardly in a direction perpendicular away from the reed plane, the passage

means having a rounded termination, the channel also tapering inwardly in the weft picking direction between two successive laminas with nozzles, each of said laminas with a nozzle being followed in the weft picking direction with a lamina having passage means larger than the passage means of a preceeding lamina with nozzle, so that the passage means opening on the reed side widens in a stepped form toward the nozzle, each nozzle being situated near a passage means opening on the reed side of the lamina and is so directed that the axis of the nozzle stream has increasing spacing relative to the reed plane in the picking direction and that the axis of each nozzle stream has a decreasing spacing relative to the main axis location in picking direction, the axis of each nozzle stream being free of intersection with a peripheral surface of that side of the passage means upon which the nozzles are located.

4,328,843

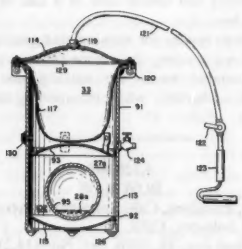
PRESSURIZED DISPENSERS FOR DISPENSING PRODUCTS UTILIZING A PRESSURE TRANSFER FLUID

Minoru Fujii, 5601 - 52nd Ave. S., Seattle, Wash. 98118

Division of Ser. No. 880,619, Feb. 2, 1978, Pat. No. 4,202,470, which is a continuation-in-part of Ser. No. 775,098, Mar. 7, 1977, abandoned. This application Jan. 11, 1980, Ser. No. 111,267

Int. Cl.³ B65B *3/04;* B65D *83/14*

U.S. Cl. 141—1 **18 Claims**



1. A method of reservoiring or dispensing a fluid product from a container, comprising:

providing a closed container having an outlet opening therein,

providing a product container having a flexible wall within the closed container, the product container in fluid communication with the outlet and holding the product to be dispensed,

enclosing a liquefiable propellant or mixture of liquefiable propellant and non-liquefiable gas in a separate, sealed compartment having a flexible wall, the sealed compartment positioned within the closed container out of contact with the product container holding the product to be dispensed,

introducing a transfer fluid into the closed container for contact with the flexible wall of the compartment holding the liquefiable propellant or mixture of the liquefiable propellant and nonliquefiable gas and with the flexible wall of the container holding the product to be dispensed,

the liquefiable propellant or mixture of liquefiable propellant and non-liquefiable gas exerting pressure on the product to be dispensed through the transfer fluid to cause exit of the product to be dispensed through the outlet opening.

4,328,844

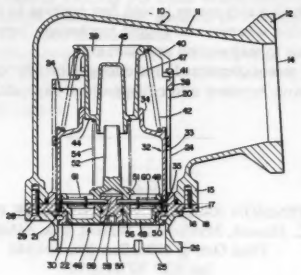
PRESSURE FUELING ADAPTER

Robert L. Becktel, Lagana Niguel, Calif.; Robert P. Greenwell, Mercer Island, Wash., and Basil B. Tilling, Mission Viejo, Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 27, 1980, Ser. No. 125,003

Int. Cl.³ B65B *3/04;* F16L *79/00*

U.S. Cl. 141—302 **21 Claims**



1. An aircraft fueling adapter, comprising

a housing having inlet and outlet ports,

a valve seat in said housing between said inlet and outlet ports, said valve seat being annular and disposed closely adjacent said inlet port,

primary and secondary poppets movable toward and away from said valve seat for closing and opening the path for fluid flow between said inlet and outlet ports, said primary poppet being generally cylindrical and having a sealing portion cooperable with said valve seat, said primary poppet being slidable within said secondary poppet and being disposed near said inlet port and operable to an open position to apply fluid pressure from said inlet port to said secondary poppet, said secondary poppet being disposed between said primary poppet and said outlet port, and

means biasing said poppets toward said valve seat to close the path for fluid flow,

said secondary poppet being an annular check valve operable to open in response to fluid pressure at said inlet port, said secondary poppet having an inner periphery closely adjacent said primary poppet for guiding the latter toward and away from said valve seat.

4,328,845

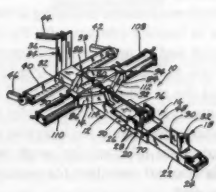
LOG SPLITTER

Gregory J. Herbers, Blue Grass; Wendell C. Hunt, Ottumwa, and Brian G. Moriarity, Mason City, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 22, 1980, Ser. No. 219,324

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 A **7 Claims**



1. A log splitting device comprising:

a frame having opposite ends;

a wedge means fixed to one of said opposite ends of said frame;

a ram means mounted on said frame for sliding longitudinal movement from a first position spaced from said wedge means to a second position closer to said wedge means;

a ram rod operatively connected to said ram means;

toggle mechanism connected to said ram rod and said frame, said toggle mechanism having at least two toggle links pivotally connected to one another, and being movable from a collapsed position wherein said toggle mechanism holds said ram means in said first position to an expanded position wherein said toggle mechanism moves said ram means to said second position; and

power means connected to said toggle links for causing them to move between said collapsed and expanded positions.

4,328,846

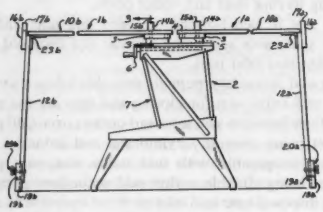
EXTENSION ASSEMBLY FOR A WORK BENCH

Palmer C. Hanson, Manitowish Waters, Wis. 54548

Filed Oct. 6, 1980, Ser. No. 194,546

Int. Cl.³ B27H *1/02*

U.S. Cl. 144—287 **5 Claims**



1. An extension assembly for attachment to a work bench to accommodate and support and elongated object comprising

at least one horizontal member having a first portion adapted to be releasably attached to a horizontal table of the work bench and having an auxiliary object support surface spaced from the horizontal table,

at least one substantially upright member operatively connected to said at least one horizontal member and having a bottom portion adapted to contact a support surface,

said upright member acting to vertically support another portion of said at least one horizontal member,

said first portion of said at least one horizontal member lying in sandwiched relationship to the horizontal table of the work bench while being supported thereby,

releasable attachment means coupled to said at least one horizontal member securing said first portion to the work table,

said first portion being disposed in sandwiched relationship above the horizontal table,

said releasable attachment means including a member having a lower surface in bearing contact with the upper surface of the work bench and an upper surface forming an object surface above the surface of the horizontal table of the work bench and the at least one horizontal member,

said member having at least one downwardly extending pin in said sandwiched relationship for insertion into a vertical hole in the horizontal table of the work bench at least through said horizontal member for securing said first portion thereto, and

said horizontal member being vertically adjustable to selectively align said auxiliary support surface with said upper surface of said member along a desired plane.

4,328,847

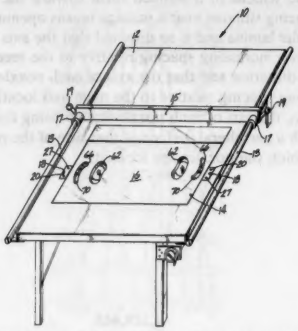
UNIVERSAL WOODWORKING MACHINE

William K. King, Sr., 80 Schupp Rd., Hamden, Conn. 06514

Filed Jun. 30, 1980, Ser. No. 164,301

Int. Cl.³ B27F *1/06*

U.S. Cl. 144—326 R **18 Claims**



1. An apparatus for making both the male and female cuts of a joint on a wooden workpiece wherein said male cut is made in a single pass comprising:

a stand;

a support plate pivotably mounted on said stand;

means for pivoting said support plate from a first position to a second position;

a pair of cutting tools mounted on said pivotable support plate defining the center line of a cut to be made and movable thereon;

first adjustment means for moving said cutting tools in unison while maintaining their same relative position; and

second adjustment means for moving said cutting tools relative to each other while maintaining the same center line of cut.

4,328,848

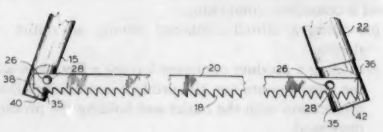
BOW SAW

Jack V. Miller, Pasadena, Calif., assignor to Acroform Corporation, City of Industry, Calif.

Filed Jan. 22, 1980, Ser. No. 114,214

Int. Cl.³ B27B *21/00*

U.S. Cl. 145—33 R **5 Claims**



1. A bow saw comprising a hollow tubing having a pair of curved sections in a common plane presenting a distal and a proxal end, each end defining an opening therein and a pair of saw blade retaining slots in the adjacent wall regions of said distal and proxal ends,

said distal and proxal ends having different internal distance between the respective saw blade retaining slots and the opposite internal wall thereof,

a saw blade having slot retaining obstructions extending transverse to the thickness of the saw blade at each end region thereof and at different distances frcm the end at the opposite ends thereof,

one of said obstructions farther from its end than the distance between one saw blade retaining slot and the opposite internal wall of one end of said bow saw,

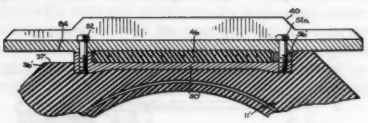
whereby said saw blade may be secured with said obstruction within said proxal and distal ends in one direction only.

4,328,849

VEHICLE TIRE WITH TRACTIVE ELEMENTS

Deepak V. Dighe, Troy, Mich.; Earl F. Burton, Townville, S.C., and Robert J. Wozniak, Troy, Mich., assignors to Uniroyal, Inc., Middlebury, Conn.

Filed Jun. 19, 1980, Ser. No. 161,084
Int. Cl.³ B60C *27/06*; B62D *55/24*
U.S. Cl. 152—176 **7 Claims**



1. A vehicle tire comprising:

(a) a pneumatic tire carcass constructed and arranged so that at least the crown region of said carcass is substantially circumferentially and radially extensible, said carcass having a tread formed integrally therewith and overlying the crown region of said carcass, said tread including a plurality of substantially axially extending, raised ribs spaced around the circumference of the carcass so that each pair of adjacent ribs defines a generally axially extending groove therebetween;

(b) a flexible endless belt extending circumferentially around said carcass radially outwardly of said ribs, said belt being substantially inextensible at least in the circumferential direction;

(c) a plurality of axially extending retainer elements mounted generally radially inwardly of said belt so that each of said retainer elements lies in a respective one of said grooves, each one of said retainer elements having a pair of projections at axially opposite ends, said projections extending radially outwardly beyond the radially inwardmost surface of said belt on axially opposite sides of said belt and confining said belt therebetween to limit axial motion of said belt relative to said retainer elements, at least one of the projections of each retainer element being formed separately from the remainder of that retainer element;

(d) means for releasably attaching each such separately formed projection to the remainder of the retainer element associated therewith;

(e) a plurality of tractive elements mounted around the periphery of said tire radially outwardly of said belt, each of said tractive elements being associated with at least one of said retainer elements;

(f) means for releasably attaching said tractive elements to the respective retainer elements associated therewith; and

(g) means for preventing axial motion of said retainer elements relative to said carcass while said carcass is inflated, said means for preventing axial motion of said retainer elements including a pair of circumferentially and radially extending flanges formed integrally with said carcass and closely abutting the axially opposite ends of said retainer elements, one of said flanges having an outermost radius smaller than that of the other of said flanges and substantially equal to the innermost radius of said belt when the latter is disposed around said tread, said retainer elements lying in said grooves so that each separately formed projection of said retainer elements lies on the axially opposite side of said tire from said one flange;

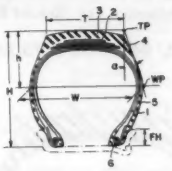
(h) whereby upon inflation of said carcass with the assembly constituted of said belt, said tractive elements and said retainer elements positioned around said tread, said crown region of said carcass is expanded against said assembly to maintain the same taut on said carcass and complete the tire, and the tire may be partially disassembled for maintenance by releasing the tractive elements from the retainer elements, deflating the carcass, releasing each separately formed projection from the remainder of its respective retainer element, and sliding the said respective retainer element axially of the carcass over said one flange and out from under said belt.

4,328,850

RADIAL TIRE FOR TRUCK AND BUS HAVING SPECIFIED TREAD TO TIRE WIDTH RATIO

Yukihisa Uemura, Nara, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 931,546, Aug. 7, 1978, abandoned. This application Dec. 4, 1980, Ser. No. 213,008
Int. Cl.³ B60C *3/00, 9/08*
U.S. Cl. 152—209 R **1 Claim**



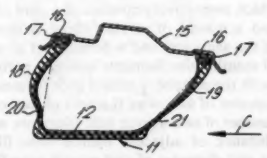
1. A radial tire for trucks and buses including a carcass ply layer of textile cords and a belt layer of steel cords characterized in that said radial tire is so constructed to have a tread angle of 17° plus or minus 3° when inflated with an air pressure of use, said tread angle being formed by a line directed from a width-end point of a tread to a width-end point of a tire body and a line directed from a width-end point of the tread in a straight vertical direction; and to have a tread angle change of not more than 3° before and after inflation of the tire with full pressure.

4,328,851

PNEUMATIC TIRE

James N. Randle, Atherstone, England, assignor to British Leyland UK Limited, London, England

Continuation of Ser. No. 795,367, May 9, 1977, abandoned. This application Feb. 14, 1979, Ser. No. 12,017
Claims priority, application United Kingdom, May 21, 1976, 7621011
Int. Cl.³ B60C *5/00*
U.S. Cl. 152—330 RF **3 Claims**



1. A pneumatic tire with improved ride and handling characteristics comprising a pair of sidewals of substantially equal length interconnected by a tread portion, each said sidewall having a bead formed around the inner periphery of said sidewall; said tread being of braced tread construction so that the tread is relatively inextensible, and being of a width which is less than the width of the tire at said beads; each sidewall having a flex area of a thickness less than that of the remainder of the sidewall, in that annular half portion of the sidewall remote from the bead, and each sidewall, in a normal inflated condition of the tire, diverging with respect to said tread

throughout a major portion of the distance between said tread and said beads, said sidewalls, flex area, and bead width cooperating with said braced tread to provide means for tilting the tread with respect to the axis of the tire in response to forces causing lateral deflection of the tread in either direction from a normal centered position with respect to the beads, and wherein said tire further comprises carcass cords extending from the bead of one sidewall to the bead of the other sidewall.

4,328,852

PNEUMATIC VEHICLE TIRE EMPLOYING CORDS HAVING A SINGLE WIRE FILAMENT CORE AND A MANTLE

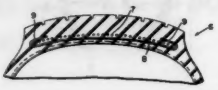
Dionysius J. Poque, Aachen-Kornelimünster; Georg Freudenstein, Aachen, and Horst Lorenz, Stolberg-Büsbach, all of Fed. Rep. of Germany, assignors to Uniroyal Englebert, Aachen, Fed. Rep. of Germany

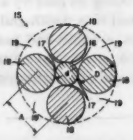
Filed Feb. 19, 1981, Ser. No. 236,124

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006488

Int. Cl.³ B60C *9/20*; D07B *1/06*

U.S. Cl. 152—359 **8 Claims**





1. A pneumatic vehicle tire which includes a carcass, beads, a tread, and a belt-like reinforcement located between said carcass and said tread, said reinforcement comprising at least two cord plies which are radially superimposed over one another, the width of at least one of said cord plies being approximately equal to the width of said tread, said cord plies comprising cord elements, with the cord elements of each ply extending at a given angle, the angles of the cord elements of adjacent cord plies being different, so that the cord elements of one ply cross those of an adjacent ply, the cord elements of at least one of said cord plies comprising rubberized metallic cord elements which respectively consists of a core of a single wire filament, and a mantle of at least three twisted single wire filaments of the same size and a diameter of at most 0.28 mm, each of said mantle wire filaments having a peripheral portion in contact with the periphery of said wire filament of said core, with the diameter of said wire filament of said core being less than the diameter of said mantle wire filaments, and the center-to-center distance of adjacent mantle wire filaments being greater than said diameter of said mantle wire filaments.

4,328,853

FOLDING SCREEN FOR LIGHT-PERMEABLE SKYLIGHTS AND THE LIKE

George R. Gall, 45 Farwood Dr., Chagrin Falls, Ohio 44022, and Charles R. Gates, 15070 Hill Dr., Novelty, Ohio 44072

Filed Dec. 21, 1979, Ser. No. 106,357

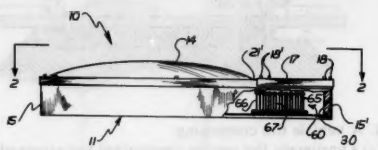
Int. Cl.³ F05D *15/26*

U.S. Cl. 160—183 **7 Claims**

1. In a folding radiation screen having predetermined permeability to sunlight, which screen may be partially or fully extended beneath a bubble in a skylight or light-permeable roof structure, and which comprises, a plurality of rigid planar elongated panels having thickened longitudinal edges successively hinged together for co-action in side-by-side relationship; parallel overhead track means inclinedly disposed at an angle less than 75° with respect to the horizontal, to support said screen for to-and-fro translation between one end of said track means and the other; an end panel pivotable about a fixed lower edge adjacent said one end of said track means; and drive means to open and close said screen, the improvement comprising,

(a) mono-level track means supporting opposite ends of each of said panels,

(b) plural elongated rigid hinge members each having



(i) back-to-back tubular twin channels symmetrically disposed about a vertical axis, said channels each having one thickened longitudinal edge of successive panels slidably disposed in each channel, and,

(ii) longitudinal camming slot means in each channel of preselected hinge members, said camming slot means having a width such that an edge limits movement of a panel so that when said screen is extended, extended panels lie at an angle from about 5° to about 30° to the horizontal, in an undulating planar configuration which allows said screen to be collapsed into an upstanding generally vertical configuration, after it has been retracted.

4,328,854

CASTING CORE FOR AN INTAKE PIPE ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

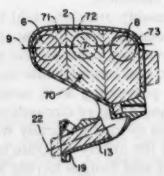
Jurij Gartner, Germering; Helmut Hengl; Karl Sixt, both of Munich, and Reinhard Woltmann, Puchheim, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Division of Ser. No. 885,977, Mar. 13, 1978, Pat. No. 4,228,769. This application Mar. 19, 1980, Ser. No. 131,849

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711195

Int. Cl.³ B22C *9/10*

U.S. Cl. 164—369 **1 Claim**



1. Casting core apparatus for manufacturing an intake-pipe assembly, for internal combustion engines of the type including four to six cylinders arranged in line or the like, having:

an intake manifold,

and a plurality of intake pipes opening into one side of said intake manifold at respective manifold end segments of said intake pipes,

each of said intake pipes including a connecting end segment having an extreme end portion attachable to inlet channel means of an engine and a curved intermediate segment

interconnecting the respective manifold end segments and connecting end segments,

wherein said intermediate segments overlap one another and extend in respective intermediate segment planes, said intermediate segment planes being angularly inclined with respect to one another and intersecting with one another near a common intersection area for said intermediate and connecting end segments,

wherein a plurality of intake pipes are disposed at a second side of said one side of said intake manifold, said intake pipes at said second side being similar to, and arranged pairwise symmetrically with respect to, the intake pipes at said one side, the improvement comprising:

a core part for the intermediate part of the intake manifold,

core parts for each pair of two similar individual intake pipes forming together with the core part for the intermediate part of the intake manifold, an integral core segment,

the core segments being permanently connected to one another near their core parts for the intake manifold.

4,328,855

METHOD AND APPARATUS FOR CONTROLLING AUTOMOBILE AIR CONDITIONERS

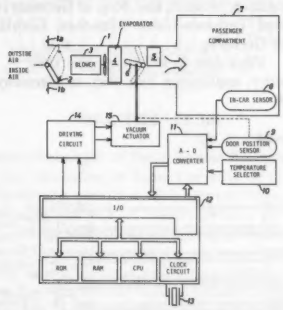
Yasuhiro Iwata, Aichi; Kiyoshi Usami, Obu; Masanori Naganoma, Kariya; Teiichi Nabeta, Okazaki, and Yasuhumi Kojima, Gifu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 17, 1979, Ser. No. 85,510

Claims priority, application Japan, Oct. 20, 1978, 53/129657

Int. Cl.³ F25B *13/00*; B60H *3/00*

U.S. Cl. 165—2 **6 Claims**



1. A method for controlling an automobile air conditioner in which a control member is provided to adjust the output of said air conditioner from maximum heating to maximum cooling according to its position, the method comprising the steps of:

generating a first electric signal indicative of the actual in-car temperature, a second electric signal indicative of a desired in-car temperature, and a feedback signal indicative of the position of said control member;

calculating, in sequence, the deviation between the actual in-car temperature and the desired in-car temperature in response to said first and second electric signals at a predetermined time interval;

discriminating the previously calculated deviation in relation to the subsequently calculated deviation to detect a tendency of variation of the deviations;

determining a compensation value related to the calculated deviations in dependence upon the discrimination result of the deviations;

discriminating a value of said feedback signal in relation to the compensation value to generate an output signal in accordance with the compensation value taking into account the feedback signal value; and

controlling the position of said control member in response to the output signal to direct the actual in-car temperature towards the desired in-car temperature.

4,328,856

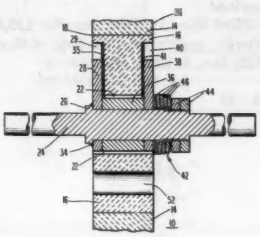
HEAT RECOVERY WHEEL

George M. Cunningham, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,778

Int. Cl.³ F28D *19/00*

U.S. Cl. 165—8 **9 Claims**



1. A rotatable heat recovery wheel comprising:

a round ceramic disk having a first face and a second face parallel thereto;

a splined metal shaft mating with said disk for rotatably driving the same without slippage between said shaft and said disk;

said splined shaft including a plurality of radially extending keys equi-angularly spaced thereabout; and

said disk including an equal plurality of radially extending key ways in and open at at least one face thereof, but not extending to the other face thereof, and equi-angularly spaced thereabout for mating with said keys.

4,328,857

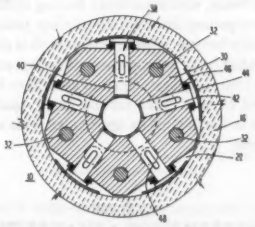
MOUNTING DEVICE FOR HEAT RECOVERY WHEELS

Burton A. Noll, Painted Post, and Richard P. Suhey, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,780

Int. Cl.³ F28D *19/00*

U.S. Cl. 165—8 **8 Claims**



1. A mounting device for a heat recovery wheel having a central bore therein comprising:

a first hub portion on one side of said wheel, and axially aligned therewith, said first hub having a central portion extending into said bore;

a plurality of radially movable shoes situated in said bore, said shoes having radially extending stems and contact portions at the radial extremity of said stems, the surface area of said contact portions being substantially greater than the cross-sectional area of said stems taken in a plane perpendicular to the axes thereof, and said contact por-

tions each comprising double cantilevered beams extending from said stems; and

a means for applying a radially directed force to said shoes whereby the contact portions of said shoes are biased against said wheel at the periphery of said bore.

4,328,858

DEVICE FOR ABSORBING HEAT FROM THE EARTH

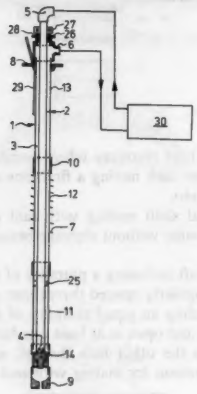
Henning Richter, Bergen, and Klaus Brocks, Ahrensburg, both of Fed. Rep. of Germany, assignors to Aero Aqua AG, Oberwil, Switzerland

Filed Mar. 31, 1980, Ser. No. 135,838

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911425; Dec. 4, 1979, 2948629

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—45 **16 Claims**



1. A device for the absorption of heat from the earth for operating a heat pump, comprising:

a probe including an outer columnar-like tubular body having a sealable lower end and an inner tubular body disposed within said outer body having an outside diameter which is less than the inside diameter of said outer body so as to define a circulation jacket between said outer body and inner body, said inner body having at its lower end an overflow opening into said circulation jacket; and

a seating body having an axial bore which is disposed in said outer tubular body adjacent to said lower end thereof and a piston removably seated in said axial bore for sealing said lower end of said outer tubular body, said piston being provided in the area of its upper face with a rod-connecting element.

4,328,859

MOUNTING DEVICE FOR A HEAT EXCHANGER IN THE CASING OF A HEATING, VENTILATION AND/OR AIR CONDITIONING APPARATUS, PARTICULARLY FOR THE PASSENGER SPACE OF A MOTOR VEHICLE, AND AN EXCHANGER PROVIDED WITH SUCH A DEVICE

Jean-Francois Bouvot, Le Mesnil-St-Denis, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France

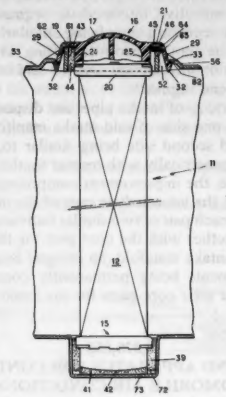
Filed Dec. 12, 1979, Ser. No. 102,863

Claims priority, application France, Dec. 22, 1978, 78 36166

Int. Cl.³ F28F *9/00*

U.S. Cl. 165—78 **13 Claims**

1. A device for mounting and fixing a heat exchanger in a casing of a ventilation apparatus for an automotive vehicle, said heat exchanger having a water box at one end, wherein said water box is formed with resilient lugs adapted to cooperate by hooking with stationary parts of the casing at the end of the introduction of the heat exchanger inside the casing.



4,328,860

RECUPERATOR FOR HEAT EXCHANGE BETWEEN FLOW MEDIA OF DISSIMILAR TEMPERATURES

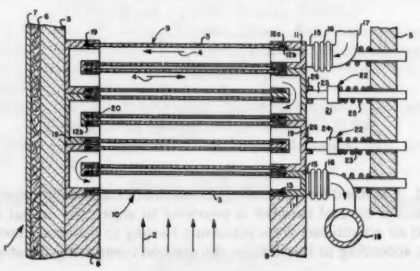
Wilhelm Hoffmüller, Munich, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munchen, GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 148

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2758998

Int. Cl.³ F28F *5/00*

U.S. Cl. 165—81 **11 Claims**



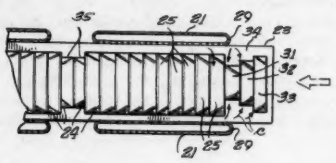
1. A recuperator for a gas turbine for heat exchange between two flow media of dissimilar temperatures, comprising a housing for containing the flow of a first of the two flow media, a plurality of essentially parallel slidable supported tubes containing the flow of the second flow medium being arranged in said housing, said tubes being made of a highly heat-resistant ceramic material and extending at right angles to the direction of flow of the first flow medium through the housing and spaced to permit flow thereof around the tubes, plural sets of flow deflection connector means located within said housing for interconnecting at least two tubes at a time at adjacent ends to create a meandering flow of the second medium through the tubes by deflecting the flow from the one tube into another tube, each of said sets having a plurality of separate flow deflection connector means, a first of said sets being positioned against a wall of said housing containing said first flow and engaging respective first ends of said tubes, and expansion

pressure means acting on a surface of each respective connector means of a second of said sets which faces away from respective second ends of the tubes for urging the second set of connector means against the second ends of the slidable supported tubes associated therewith, wherein said pressure means comprises an expansion mechanism which applies a resilient biasing pressure and is located between a first wall of the housing and those of said connector means that are arranged at the second ends of the tubes to urge the connector means against the second ends of the tubes, causing the tubes to be urged against the first set of connector means arranged at the first ends of the tubes and abutted against said housing wall, wherein each connector means of said sets of connector means has a number of annular slots corresponding to the number of tubes to be connected to it, in which slots are slidably inserted the adjacent ends of the tubes to be connected to this connector means, with a seal of highly heat-resistant material installed in each annular slot between the tube end inserted into this annular slot and the bottom of the annular slot.

4,328,861
LOUVRED FINS FOR HEAT EXCHANGERS

Alex S. Cheong, and Richard P. Beldam, both of Mississauga, Canada, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 21, 1979, Ser. No. 50,924
Int. Cl.³ F28D *1/02, 1/32*
U.S. Cl. 165—151 **12 Claims**



1. In a heat exchanger of the tube and fin core or plate-fin separator type including at least one row of flat tubes and wherein the fins are provided with louvres extending longitudinally parallel to the row of tubes and have an overhanging portion beyond the row of tubes, the improvement comprising at least one row of longitudinally shortened louvres, each louvre in said row of longitudinally shortened louvres shorter than the length of the normal louvres located between adjacent tubes in the row and said row of longitudinally shortened louvres formed in the overhanging portion of the fin adjacent the outer edge thereof beyond the edges of the row of tubes.

4,328,862
TUBE BUNDLE HEAT EXCHANGER

Rene Gossalter, St. Gallen, Switzerland, assignor to Swisscal Holding S.A., Panama

Filed Feb. 12, 1979, Ser. No. 11,578
Claims priority, application Switzerland, Feb. 13, 1978, 1538
Int. Cl.³ F28F *9/04*
U.S. Cl. 165—158 **15 Claims**

1. A tube bundle heat exchanger with sealing means for replaceable heat exchanger tubes comprising:

a jacket tube through which a plurality of fluid carrying tubes pass, a first fluid flow means connected to said jacket tube;

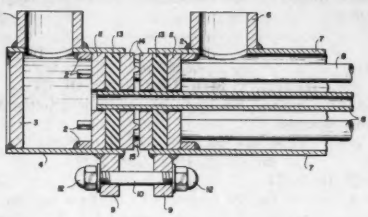
an extension tube in axial alignment with said jacket tube into which fluid is admitted, a second fluid flow means connected to said extension tube;

a first sealing means surrounding each of said fluid carrying tubes passing through said jacket tube and confined by one end of said jacket tube;

a second sealing means surrounding one end of each of said fluid carrying tubes extending into said extension tube and confined by one end of said extension tube adjacent said first sealing means;

each of said first and second sealing means including an elastic sealing medium sandwiched between first and second rigid plates;

said elastic sealing medium and said first and second rigid plates having the same outer diameter as the inner diamter of said jacket tube and said extension tube with said second rigid plates positioned adjacent each other;



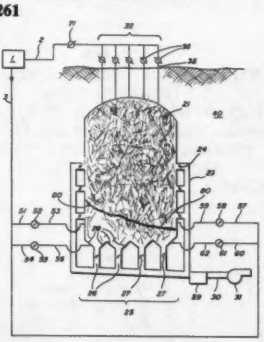
abutment means secured within and to said jacket tube and said extension tube for supporting said first rigid plates against axial movement within said jacket tube and said extension tube, and

whereby said first and second rigid plates press against said elastic sealing means to force said elastic means into a sealing engagement with said fluid carrying tubes, said jacket tube and said extension tube.

4,328,863
IN SITU RETORTING OF OIL SHALE

Kay L. Berry, Denver, Colo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 14, 1980, Ser. No. 130,551
Int. Cl.³ E21B *43/247*
U.S. Cl. 166—261 **12 Claims**



1. An improved method for the underground in situ retorting of a rubblized mass of oil shale which increases the total hydrocarbon recovery from said oil shale, comprising the steps of:

establishing a flame front generally across a rubblized mass of oil shale in an underground retort;

advancing said flame front downwardly through a substantial portion of said rubblized mass by injecting a first flame front-supporting gas containing oxygen downwardly to said flame front from a top portion of said retort to retort said rubblized mass immediately below said flame front, said flame front becoming irregular as said flame front is advanced with an advancing portion of said flame front moving ahead of a lagging portion of said flame front;

discontinuing the injection of said first flame front-support-

ing gas when said advancing portion of said flame front moves a predetermined distance below said lagging portion of said flame front; and

advancing said lagging portion of said flame front downwardly to a position in general coplanar alignment with said advancing portion of said flame front after the injection of said first flame front-supporting gas has been discontinued by injecting a second flame front-supporting gas containing oxygen upwardly to said lagging portion from a bottom portion of said retort to effectively retort said rubblized mass immediately below said lagging portion.

4,328,864

METHODS FOR RECOVERY OF OIL

Robert H. Friedman, Houston, Tex., assignor to Getty Oil Company, Houston, Tex.

Filed Nov. 20, 1980, Ser. No. 208,694
Int. Cl.³ E21B *33/138, 43/22*
U.S. Cl. 166—274 **17 Claims**

1. A method for the recovery of oil from a subterranean formation having a formation temperature of no more than about 175° F., and having therein some portions which are relatively oil-rich and other portions which are relatively water-rich, the water in said water-rich portions having an average salinity of no greater than about 7%, comprising:

providing an oil-soluble swelling polymer which has an affinity for water and which, when contacted by fresh water, will swell to more than 1000 times its weight;

then preparing an unswollen suspension by suspending said swelling polymer in a suspension liquid that will not cause the swelling polymer to swell significantly;

injecting said unswollen suspension into said subterranean formation, whereupon said swelling polymer swells in said water-rich portions to at least about 1000 times its normal size thereby obstructing pores in said water-rich portions of the formation;

pushing oil through said formation by use of a liquid flooding medium; and

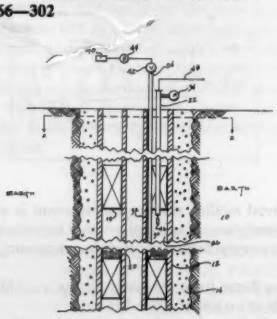
producing oil from said formation.

4,328,865

WAX CONTROL IN OIL WELLS USING A THERMAL SYPHON SYSTEM

Edward N. Hall, Rolling Hills Estates, Calif., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Aug. 12, 1980, Ser. No. 177,398
Int. Cl.³ E21B *37/00, 43/24*
U.S. Cl. 166—302 **14 Claims**



1. A method for preventing the accumulation of solid substances on the inner surface of an oil well production tube in an oil well through which crude oil is removed from below the surface of the earth comprising isolating from the well fluids a portion of the oil well annulus between the production tube and the walls of the oil well, disposing a working medium in the isolated portion of the oil well annulus around the production tube, providing contact between the lower portion of the working medium and the walls of the oil well for heating the working medium, providing a flow passage for the heated working medium to rise in the oil well for heating the outer surface of said oil well production tube where the solid substances are known to solidify and deposit on said inner surface just enough to reliquify a thin film of said solid substance immediately adjacent said inner surface of said oil well production tube so that the force of the upward flow of said crude oil as it is removed from below the surface of the earth will remove said solid substances along with said crude oil and thus prevent accumulation of said solid substances on the inner surface of said oil well production tube.

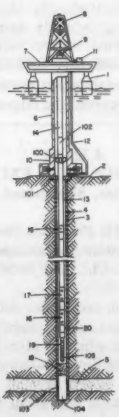
6. An oil well structure comprised of an inner tubing extending from above the surface of the earth down into the crude-oil bearing strata inside the earth and an outer casing extending from above the surface of the earth down into the earth to a point at which solid substances do not separate from said crude oil and do not deposit on the inner surface of said inner casing, said outer casing being slightly removed from said inner tubing to provide an annular space between said inner tubing and said outer casing, means on top of said inner tubing for removing the crude oil, means for plugging said annular opening between said inner tubing and said outer casing at said point at which solid substances do not separate from said crude oil, means for plugging said annular opening between said inner tubing and said outer casing at a point above where said solids are known to deposit onto the inner surface of said inner tubing, said annular opening containing a working fluid having known physical characteristics of conversion from gas to liquid and back to gas being contained within said annular opening, said upper plugging means having means through which annulus fluid can be extracted and a working fluid can be injected into the annular opening and removed from said annular opening as required to maintain appropriate pressures.

4,328,866

CHECK VALVE ASSEMBLY

John C. Zimmerman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 7, 1980, Ser. No. 128,324
Int. Cl.³ E21B *34/06*
U.S. Cl. 166—317 **26 Claims**



1. A check valve assembly comprising:

outer annular housing means having first and second aperture means through the wall thereof and having an irregular bore therethrough;

sliding annular mandrel means having an irregular exterior surface having annular shoulder means thereon disposed

between the first and second aperture means through said outer annular housing means, said sliding annular mandrel means being slidably disposed in a first position within the bore of said outer annular housing means in sealing engagement therewith having the annular shoulder means of said sliding annular mandrel means communicating with the first aperture means of said outer annular housing means while the bore of said sliding annular mandrel means communicates with the second aperture means of said outer annular housing means;

check valve seal means retained on the exterior of said outer annular housing means blocking the second aperture means of said outer annular housing means, said check valve seal means allowing communication from the bore of said outer annular housing means to the exterior thereof but preventing communication from the exterior of said outer annular housing means to the bore thereof; and

shear means disposed within said outer annular housing means having a first portion thereof engaging a portion of the irregular exterior surface of said sliding annular mandrel means and having a second portion thereof engaging a portion of the irregular bore through said outer annular housing means, said shear means initially preventing movement of said sliding annular mandrel means with respect to said outer annular housing means when said sliding annular mandrel means is disposed within said outer annular housing means in a first position therein until a predetermined amount of force is applied to said annular sliding mandrel means.

4,328,867

FIRE EXTINGUISHERS

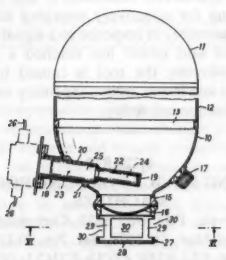
Richard C. Heath, Surrey, England, assignor to Clifford Edwards Limited, Sussex, England, a part interest

Continuation-in-part of Ser. No. 853,657, Nov. 21, 1977, Pat. No. 4,194,569. This application Aug. 21, 1979, Ser. No. 68,345

Claims priority, application United Kingdom, Nov. 22, 1976, 48658/76

Int. Cl.³ A62C *37/28*

U.S. Cl. 169—58 **11 Claims**



1. A fire extinguisher comprising a container having a wall which defines a chamber for a source of extinguishant, a diaphragm which is burstable by a detonator device in said container and which permits, upon bursting thereof, a high mass flow rate of extinguishant from the container, and venting means through which extinguishant flowing from the burstable part of the container may be discharged, said venting means including a number of axial pillars defining a plurality of discharge orifices through which extinguishant flowing from the burstable part of the container may be discharged, the number, size and position of said discharge orifices being balanced in such a manner that the reaction forces upon the container due to the flow of extinguishant from the discharge orifices substantially balance one another, and said diaphragm having a center and being formed with a number of lines of weakness which extend outwardly from said center and which promote bursting of said diaphragm into segments, said lines corresponding in number to and being substantially staggered in position in relation to said pillars which will thus be engaged by the segments on bursting of the diaphragm and blocking of said discharge orifices by said segments will be minimized.

4,328,868

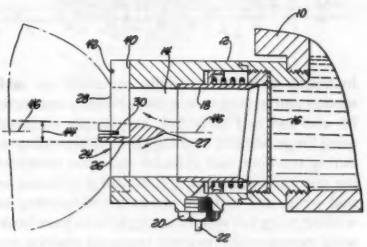
FIRE SUPPRESSANT IMPACT DIFFUSER

Anthony J. Monte, Utica, and Ernest C. Wahoski, Harper Woods, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 29, 1980, Ser. No. 111,040

Int. Cl.³ A62C *35/12*

U.S. Cl. 169—62 **2 Claims**



1. In a fire suppressant system for the interior space within a military vehicle, comprising an upright pressure-resistant bottle containing pressurized fire suppressant liquid at a pressure on the order of 750 p.s.i.; a discharge fitting connected to a lower section of the bottle and defining a horizontal cylindrical exit passage having an exit opening for the pressurized liquid; and openable valve means in the discharge fitting normally preventing liquid discharge from the bottle through the exit passage: the improvement comprising an axially elongated bullet-shaped liquid deflector element secured to the exit opening and located within the passage on the passage axis at the downstream end of the fitting, and at least two radial fins rigidly positioning the deflector element in its designated position; the deflector element having a cylindrical section connected to the radial fins, and a convergent leading nose section located upstream from the fins; the surface of the convergent nose section making a smooth gradual transition to the surface of the cylindrical section; the frontal area of the deflector element being approximately 0.07 square inches, and the passage area being in the range of 0.8 square inches to 1.8 square inches; the deflector element being disposed so that its convergent nose section is located upstream from the plane of the exit opening defined by the discharge fitting; the plane of the exit opening passing through the cylindrical section of the deflector element upstream from the element trailing end, whereby the deflector element produces radially outwardly directed flow components in the liquid as it exits from the discharge fitting.

4,328,869

IMPLEMENT WITH WING LIFT INCLUDING TOGGLE LINKS AND ROLLER

Marvin P. Perelli, Grimsby, Canada, assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 17, 1981, Ser. No. 235,279

Int. Cl.³ A01B *73/00*

U.S. Cl. 172—311 **3 Claims**

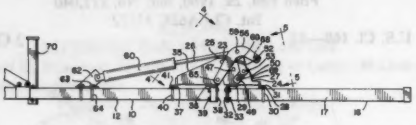
1. An agricultural implement comprising:

(a) a central section having ground wheels and depending ground working tools and a hinge bracket;

(b) a transversely extending wing having a ground wheel and depending ground working tools and a wing hinge bracket hinged to said central section bracket on an axis

above said central section for movement from an aligned working position though approximately 180° to a transport position wherein the wing is inverted over said central section; and

(c) a hydraulically powered folding means extending between said central section and said wing section to effect the wing movement, said folding means comprising: a pair of toggle links pivotally connected to each other, one of said links being pivotally connected to said wing hinge bracket, a lift arm pivotally connected to said central section hinge bracket and to the other of said links, a



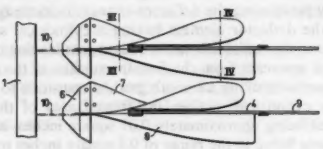
hydraulic cylinder pivotally mounted on said central section and having its rod end pivotally connected to said lift arm and said other link, stop means mounted on said wing hinge bracket, said toggle links providing wing float during working, said cylinder rod upon retraction, drawing said one toggle link against said stop means and lifting said wing, and support means for supporting said wing without wing fall when the toggle links have broken as the wing moves to the inverted transport position and return, said support means comprising a ramp on said wing hinge bracket and a roller mounted on said lift arm for contact therewith.

4,328,870

PLOUGH FOR WORKING OF SOIL

Rune Karlsson, Blacksta Pl. 5133, Nyköping, Sweden (S-611 00)

Filed Nov. 9, 1979, Ser. No. 92,834
Claims priority, application Sweden, Nov. 27, 1978, 7812180
Int. Cl.³ A01B *15/02*
U.S. Cl. 172—657 **6 Claims**



1. Plough for working of soil at the surface of the ground by cutting slices or the soil and inverting the soil to be redeposited into the same furrow characterized in that:

(a) it consists of at least two parallely spaced, upright, planar main bodies (4), each main body supporting at its front as seen in the direction of travel a substantially horizontal ploughshare (6), each main body facing an adjacent main body;

(b) in that one of said main bodies on a side facing another main body is provided with a first mouldboard (7) having a horizontal width which is less than the spacing between said main bodies, the first mouldboard projecting from the rear of the ploughshare and the other main body being provided with a second mouldboard (8) separate from the first mouldboard so that the ground is exposed between the firstand second mouldboards, the second mouldboard being on the side facing first main body, which second mouldboard is constructed to turn substantially continuously from an upright position connecting to the front portion of the main body so that its lower edge is diverging from the main body at a substantially maintained level and spaced from the opposing main body while its upper edge approaches said level, which level substantially corresponds to the level of the ploughshare; and

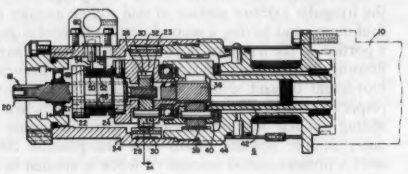
(c) in that several main bodies are arranged with the first and second mouldboards of adjacent main bodies (4) in an opposed relationship beside each other the number of main bodies depending on a number of furrows to be turned.

4,328,871

POWER TOOL SPEED AND TORQUE CONTROL MECHANISM

Richard S. Gluskin, Devon, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Jan. 28, 1980, Ser. No. 115,830
Int. Cl.³ B25B *23/145*
U.S. Cl. 173—12 **6 Claims**



1. A two speed power tool having an output member, said tool comprising:

a motor having an output shaft;

a wrap spring clutch assembly operatively connected to said motor output shaft, said clutch assembly having a first spring and a second spring wound in opposite directions to each other, and means operatively interconnecting said first and said second springs, whereby said second spring actuates said first spring;

first means for changing the output member operational speed, said first means being operatively connected to said clutch assembly and to the output member; and

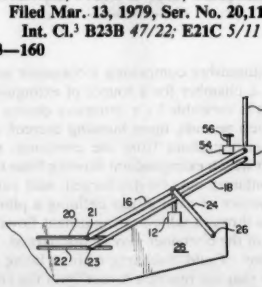
second means operatively connected to said clutch assembly second spring for selectively engaging and disengaging said clutch assembly in response to a signal indicating that the speed of said motor has reached a predetermined condition, whereby the tool is caused to shift from a higher speed and lower torque capability to a lower speed and higher torque capability.

4,328,872

ANTI-BUCKLING DEVICE FOR MINE-ROOF BOLTING MACHINES

William C. Orthwein, P.O. Box 3332, Carbondale, Ill. 62901

Filed Mar. 13, 1979, Ser. No. 20,117
Int. Cl.³ B23B *47/22*; E21C *5/11*
U.S. Cl. 173—160 **8 Claims**



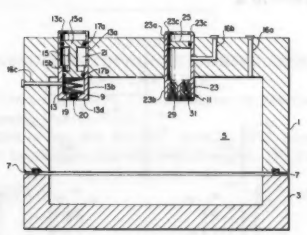
1. Apparatus for use with an underground mineshaft roof-bolting machine having a torque motor, a pinning rod held for rotation by said torque motor, means for exerting upward thrust on said torque motor to force said pinning rod upwardly

into the roof of a mine shaft, and means for manually controlling said upward thrust means, comprising means for limiting the maximum upward thrust of said upward thrust means in dependence on the elevation of said torque motor relative to said bolting machine, said limiting means comprising contoured cam means operatively connected to said upward thrust means for rotating about an axis in dependence on the elevation of said torque motor relative to said bolting machine, and cam follower means engageable with said cam means and following the contour of said cam means as said cam means rotates, said limiting means further including a pressure relief valve controlled by and operatively connected to said cam following means and limiting said maximum upward thrust pressure in dependence on the contour of said cam means, said cam means being contoured such that the maximum upward thrust on said torque motor is reduced by said pressure relief valve when said torque motor is at a comparatively low elevation relative to said bolting machine and is increased when said torque motor is at a comparatively higher elevation relative to said bolting machine, whereby the reduced upward thrust on said torque motor at the comparatively low elevation reduces the possibility of buckling of said pinning rod.

4,328,873
AUTOMATIC DEPTH COMPENSATING SYSTEM FOR DRILL BIT LUBRICATION

Eduardo B. Gonzalez, Ave. Universidad Num. 482, Mexico 13, D.F., Mexico

Filed May 27, 1980, Ser. No. 153,682
Int. Cl.³ E21B *10/24*
U.S. Cl. 175—228 **18 Claims**



1. A depth compensation system for controlling the pressure in a volume in response to pressure changes in the environment adjacent to said volume said system comprising:

(a) at least one pressure compensating means, positioned between said volume and the environment, for changing the pressure in said volume in response to pressure changes in the environment, and

(b) a pressure surge compensating means, positioned between said volume and the environment, for compensating for positive and negative pressure surges when the pressure in said volume changes relative to the pressure in the environment, said pressure surge compensating means comprising:

(i) a cylinder extending between said volume and the environment;

(ii) a piston positioned in said cylinder and forming a chamber therein;

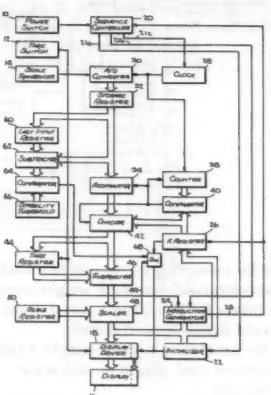
(iii) a first check valve positioned between said chamber and said volume said first check valve opening to carry fluid from said chamber to said volume when the pressure in said volume is lower than the pressure in said chamber by a first predetermined amount; and

(iv) a second check valve positioned between said chamber and said volume, said second check valve opening to carry fluid from said volume to said chamber when the pressure in said volume is higher than the pressure in said chamber by a second predetermined amount.

4,328,874
DIGITAL WEIGHING SCALE WITH SELECTABLE COMPUTATIONAL PARAMETERS

Clinton L. Gumberich, Randolph; Armando J. Visioli, Jr., Dover, and Richard H. Kunz, Budd Lake, all of N.J., assignors to Ohaus Scale Corporation, Florham Park, N.J.

Filed Mar. 3, 1980, Ser. No. 126,890
Int. Cl.³ G01G *23/01*
U.S. Cl. 177—25 **6 Claims**



1. In a scale having a digital display for producing a visual indication which is a function of the weight of an object placed on the scale, the scale including digital signal generating means for producing digital output signals proportional to the weight on the scale and digital computation means for computing the digital numbers to be displayed from the digital output signals of the digital signal generating means in accordance with a computational algorithm determined in part by at least one selected variable digital parameter, the improvement comprising:

first means for causing the digital display to automatically display a plurality of indications one at a time in succession, each indication being displayed by the digital display for a predetermined limited time interval and each indication being representative of a respective one of a plurality of alternative values for the variable digital parameter;

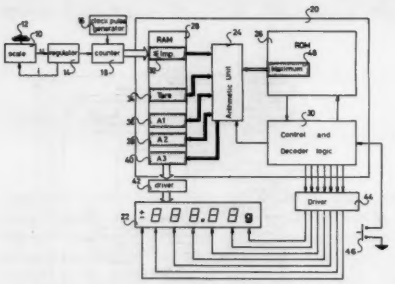
a single switch mounted on the exterior of the scale where the switch is immediately accessible to and operable by the person who ordinarily uses the scale to weigh objects, the switch having only a single operated position and being operable to the operated position by said person while said person is observing the digital display, the switch producing an output signal when operated by said person to the operated position concurrently with observation by said person of the display by the digital display of the indication representative of the alternative value desired by said person; and

second means responsive to the first means and to the output signal of the switch for storing as the selected variable digital parameter the alternative value represented by the indication being displayed by the digital display concurrently with the occurrence of the output signal of the switch.

4,328,875
SCALE WITH DIGITAL DISPLAY OF AVAILABLE WEIGHT RANGE

Hans-Peter Lechner, Wetzikon, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Apr. 7, 1980, Ser. No. 138,161
Claims priority, application Switzerland, Jul. 6, 1979, 6329/79
Int. Cl.³ G01G *13/14, 19/04*
U.S. Cl. 177—165 **6 Claims**



1. Scale for measuring the weight of a load applied thereto up to a predetermined maximum weight, comprising,

display means for furnishing a visual display in response to electrical signals applied thereto;

means for generating a gross weight signal signifying the then-present total weight on said scale;

a tare key; and

computing means responsive to activation of said tare key for computing an available weight range signal from said gross weight signal and said predetermined maximum weight and a net weight signal from said gross weight signal and said tare signal, and for applying the so computed available weight range signal and net weight signal to said display means in a predetermined order, whereby said display means displays both said available weight range number and said net weight number in responsive to activation of said tare key.

4,328,876
STEPLESS HYDROMECHANICAL STEERING BY DRIVING

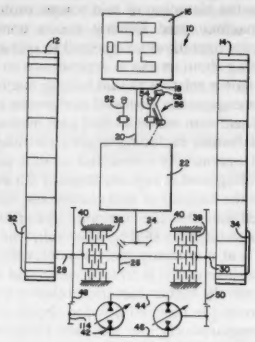
Joachim Horsch, Lombard, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sep. 17, 1979, Ser. No. 75,788
Int. Cl.³ B62D *11/18*
U.S. Cl. 180—6.44 **25 Claims**

1. In hydromechanical steering by driving:

a pair of oppositely extending axles (**28, 30**) having interposed solid axle drive means (**26**);

clutches (**36, 38**) between the drive means and each axle (**28, 30**) to mechanically drive each, primarily so; and, secondarily so when only one clutch drives,

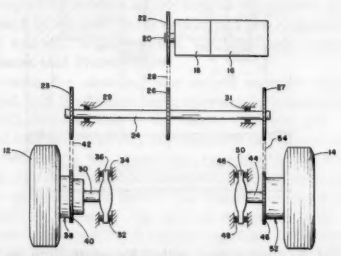


a variable ratio dual unit bidirectional drive **42** consisting of generator/motor units and interconnecting the axles in a torque transferring axle-to-axle drive path.

4,328,877
AUTOMATIC TWO-SPEED DRIVE SYSTEM

Billie E. Ballard, Box 117, Rte. 2, Sapulpa, Okla. 74066

Filed Apr. 18, 1980, Ser. No. 141,413
Int. Cl.³ B60K *17/02*
U.S. Cl. 180—70 R **9 Claims**



1. An automatic two-speed drive system for vehicles comprising:

(a) a drive source;

(b) a first drive wheel carried by a first axle operably connected to the drive source and comprising a low-speed drive hub and means to disengage said first drive wheel from the power source when said drive wheel reaches a desired rotational speed; and

(c) a second drive wheel carried by a second axle independent of the first axle, a high-speed drive hub operably connected to the drive source and means for engaging said high-speed drive hub to the drive wheel when the drive source reaches a desired rotational speed.

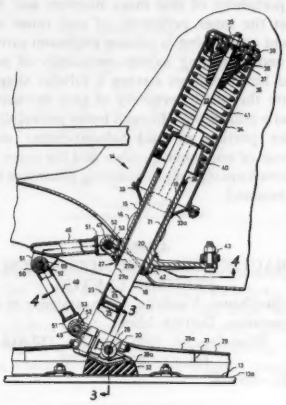
4,328,878
MOUNT FOR STEERING SKIS FOR SNOWMOBILES

Keisuke Yoshida, Cypress, Calif., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 12, 1979, Ser. No. 75,139
Claims priority, application Japan, Sep. 29, 1978, 53-120620; Nov. 30, 1978, 53-148508
Int. Cl.³ B62B *13/10;* **B62M** *27/00*
U.S. Cl. 180—182 **5 Claims**

1. In a strut-type suspension assembly for the steering ski of a vehicle to be operated on a snowy surface, said vehicle

having an axis of forward motion, wherein an axially reciprocable strut plunger with an axis extends downwardly and with a component of direction forwardly from a chassis toward a ski, mounting means for mounting said ski to said plunger,



comprising: pivot means having an axis of rotation normal to a vertical plane which is parallel to said axis of forward motion, and permitting tilting of said ski around said axis of rotation, said pivot means being rearwardly offset from said plunger axis.

4,328,879

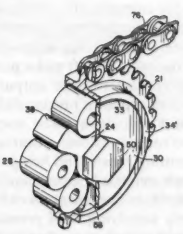
SHOCK-ABSORBING SPROCKET, DRIVE ASSEMBLY, AND THE LIKE

Robert P. Tone, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Continuation of Ser. No. 900,459, Apr. 27, 1978, abandoned. This application Sep. 22, 1980, Ser. No. 189,489

Int. Cl.³ F16H *7/02*

U.S. Cl. 180—219 **21 Claims**



1. In combination with a motorcycle, a motorcycle primary and/or secondary power transmission drive, including a driver sprocket, a driven sprocket, and a positive drive synchronous power transmission belt linking the sprockets in driving relationship and having teeth of desired pitch spaced along the inward driving surfaces of the belt meshing with mating teeth of the sprockets, wherein at least one of the sprockets is a torsionally shock-absorbing power transmission assembly having a hub with at least one radially protruding lug, a rim with circumferentially disposed teeth and at least one inwardly extending ear adapted to mate with the lug of the hub, outer flange bearings attached to and sandwiching the hub on either side thereof, ring surfaces attached to the rim and disposed axially on either side of the sprocket teeth respectively forming radial bearing surfaces with each of the flange bearings, and elastomeric cushion means interposed between the lug and ear to transmit torque therebetween, the cushion means being so configured relative to the shock-absorbing power transmission assembly to define a void volume of at least about 20 percent of the captive sprocket assembly volume determined by the hub, and rim surfaces and other portions of the shock-absorbing power transmission assembly, to accommodate in use angular deflections of at least 9 degrees of the hub relative to the rim.

4,328,880

CIRCULAR LADDER

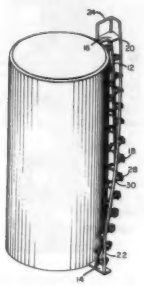
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Jun. 2, 1980, Ser. No. 155,535

The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.

Int. Cl.³ E06C *9/02, 7/08*

U.S. Cl. 182—93 **5 Claims**



1. A ladder for use along a curved wall and comprising:

a single stringer adapted for mounting between an upper level and a lower level at a predetermined angle of inclination and disposed in a curved path substantially parallel to a curved mounting wall;

a first plurality of half tread members disposed on one side of said stringer and spaced along the length thereof;

a second plurality of half tread members disposed along the opposite side of said stringer and spaced along the length thereof;

said first and second plurality of tread members being disposed in alternating arrangement on respective sides of said stringer;

each of said half tread members having a foot support portion outwardly extending from said stringer, the first plurality of half tread members being attached to the curved mounting wall, and at least said second plurality of half tread members having rail support means outwardly extending from the foot support portion and terminating substantially in a plane forward and parallel to a plane passing through the front edges of the foot support portions; and

a handrail attached to said rail support means and lying in the forward plane.

4,328,881

FLUID COUPLING DEVICE AND BIMETAL COIL MOUNTING ARRANGEMENT

Douglas D. Rohrer, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 933,309, Aug. 14, 1978, Pat. No. 4,185,726. This application Dec. 10, 1979, Ser. No. 102,054

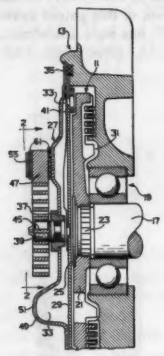
Int. Cl.³ F16D *43/25*

U.S. Cl. 192—58 B **4 Claims**

1. In a fluid coupling device of the type including a first rotatable member defining an axis of rotation, cover means associated with the first member to define a fluid chamber therebetween, a valve plate disposed to separate the fluid

chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable member disposed in the fluid operating chamber and rotatable relative to the first member, valve means operable to control fluid communication between the operating chamber and the reservoir chamber including a valve shaft disposed generally axially and extending outwardly through the cover means and being rotatable relative thereto, a bimetal element having a first end portion operatively connected to the valve shaft and a second end portion, the improvement comprising:

(a) a clip member including a pair of wing portions oriented generally parallel to the adjacent surface portion of the cover means;



(b) a resilient, elastomeric member surrounding the second end portion of the bimetal element and being in engagement therewith;

(c) the second end portion of the bimetal element and said elastomeric member being engaged on at least one side by said clip member and, on a second side, by one of the cover means and said clip member

(d) means for attaching said wing portions to the cover means to define an enclosure; and

(e) said enclosure being configured to engage the elastomeric member and to compress said elastomeric member against the second end portion on at least two sides thereof.

4,328,882

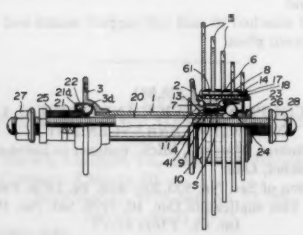
REAR HUB FOR A BICYCLE

Mitsuhide Isobe, Toyonaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 21, 1980, Ser. No. 132,414

Int. Cl.³ F16D *41/34, 11/08*

U.S. Cl. 192—64 **5 Claims**



1. In a rear hub for a bicycle, which is provided with a tubular hub shell having a pair of first and second hub flanges, an inner member fixed to said hub shell, an outer member supported freely rotatably with respect to said inner member and having at least one sprocket at the outer periphery thereof, a pair of first and second bearings carrying said outer member freely rotatably with respect to said inner member, and a unidirectionally rotary transmission comprising pawls supported at the outer periphery of said inner member and ratchet teeth provided at the inner periphery of said outer member, the improvement comprising: a tubular extension provided at said hub shell and extending axially outwardly of said first hub flange, said inner member having a tubular shape and being sleeved onto the outer periphery of said extension and fixed thereto; and a plurality of through bores provided at an axially intermediate portion of said tubular inner member, said through bores of said inner member and the outer periphery of said extension forming accommodating chambers in which said pawls are retained.

4,328,883

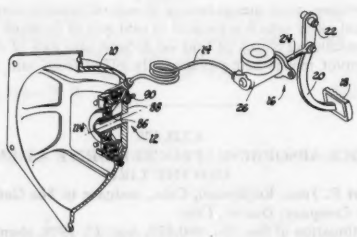
HYDRAULIC ACTUATOR MECHANISM FOR A FRICTION CLUTCH

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 16, 1980, Ser. No. 187,813

Int. Cl.³ F16D *25/08*

U.S. Cl. 192—85 CA **3 Claims**



1. A hydraulic actuator mechanism for a friction clutch having an output shaft and a clutch spring disposed coaxial with the output shaft for engaging the clutch, said clutch being manually released, said mechanism comprising; a housing having a pair of cylinders each having an axis parallel with and radially spaced from the output shaft and a pair of intersecting internal fluid passages spaced from the output shaft and interconnecting said cylinders; a pair of pistons slidably disposed in respective ones of said cylinders; force transmitting means operatively connected to said pistons; a bearing member abutting said force transmitting means and being operatively connected with the clutch engaging spring; and pedal operated operator means in fluid communication with said internal passages for selectively supplying fluid pressure through said internal passages to said cylinders so that said pistons will be extended to operate the clutch spring through said bearing and force transmitting means to disengage said clutch, said clutch spring being operable to cause retraction of said pistons in said cylinders when the fluid pressure is released to engage said clutch.

4,328,884

CLUTCH EMPLOYING ARTICULATED CLUTCH SHOES AND FLYWEIGHTS

Robert D. Meldahl, Granville, and Robert J. Borel, Columbus, both of Ohio, assignors to J. A. Masterson & Co., Columbus, Ohio

Continuation-in-part of Ser. No. 808,336, Jun. 20, 1977, Pat. No. 4,226,313. This application May 2, 1980, Ser. No. 146,102

Int. Cl.³ F16D *43/14*

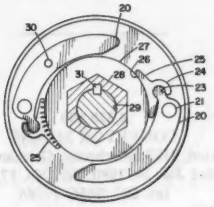
U.S. Cl. 192—105 CF **4 Claims**

1. A flyweight clutch characterized by a casing drum, shoes

and flyweights having a greater reserve torque capacity at low engine speeds with lower stress on the drum comprising:

(a) a cylindrical drum of friction material;

(b) at least a pair of clutch shoe segments in close proximity to said drum;



(c) at least a pair of flyweights, closely surrounding the drum and pivoted to the casing, each of which has a weight on one end and a toe in contact with said shoe, whereby the clutch transfers a balance of forces to the drum through the flyweights to the toe and shoes allowing the engine adequate reserve torque at low engine speeds without stalling.

4,328,885

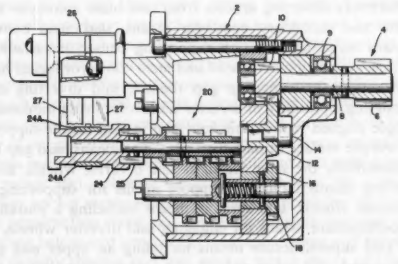
ACTUATOR ACTIVATED SWITCHING MECHANISM

John Zouzoulas, Williamsville, N.Y., assignor to Andco Actuator Products, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 100,281, Dec. 5, 1979. This application Feb. 20, 1980, Ser. No. 122,849

Int. Cl.³ F16D *71/00*

U.S. Cl. 192—142 R **21 Claims**



1. A switching mechanism for operation in conjunction with an electrically driven actuator, said switching mechanism comprising:

coupling means for connecting said switching mechanism to the actuator;

a plurality of electrical switches;

a drive gear coupled between said coupling means and said switches for mechanically operating each of said switches in dependence upon the movement of the actuator;

a plurality of planetary gears arranged around and in engagement with said drive gear so as to rotate in conjunction with said drive gear;

a plurality of counting means, each of said counting means serving to couple one of said planetary gears to a respective one of said switches, each of said counting means being connected so as to turn the associated said switch on or off after a certain number of revolutions of said drive gear;

means for individually disengaging each of said planetary gears from said drive gear and rotating such planetary gear for advancing the associated said counting means a preselected number of turns so as to set said counting means for actuating its associated said switch after a predetermined number of turns of said drive gear; and,

means for automatically returning each of said planetary gears to its position in engagement with said drive gear after the associated said counting means has been set.

4,328,886

DEVICE FOR FEEDING CIGARETTES IN BULK TO THE HOPPER OF A PACKAGING MACHINE

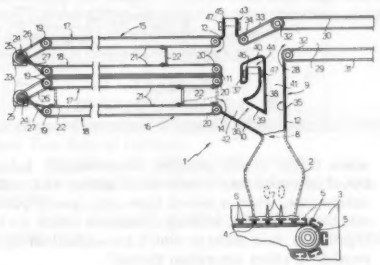
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Feb. 22, 1980, Ser. No. 123,659

Claims priority, application Italy, Mar. 5, 1979, 3339 A/79

Int. Cl.³ B65G *1/00*

U.S. Cl. 198—347 **4 Claims**



1. A device for feeding cigarettes in bulk to the inlet hopper of a packaging machine, comprising a feed channel arranged to continuously receive cigarettes from at least one production machine, a compartment arranged for connection to the inlet hopper by way of a lower aperture and to receive cigarettes from said feed channel through an upper aperture, at least one variable capacity store communicating with said compartment, and means for controlling the capacity of said store in accordance with the quantity of cigarettes present inside said compartment, wall means are disposed inside said compartment to define in the interior thereof two channels extending between said upper aperture and said lower aperture, and of which one is of substantially straight vertical fall channel through which cigarettes can move at relatively high speed, and the other is a secondary curved channel through which cigarettes can move at relatively slow speed; an inlet-outlet mouth of said store opening into said secondary channel, and said control means being disposed in said secondary channel.

4,328,887

UNSCRAMBLER-UNLOADER

James D. Beard, Overland Park, Kans.; Donald J. Nelson, Kansas City; Kirk J. Haller, Raytown, both of Mo., and Kenneth E. Bowers, Prairie Village, Kans., assignors to Ethyl Development Corporation, Richmond, Va.

Filed Apr. 7, 1980, Ser. No. 137,566

Int. Cl.³ B65G *47/14*

U.S. Cl. 198—396 **23 Claims**

1. A multistation apparatus for unloading and unscrambling containers from a storage hopper, said apparatus comprising:

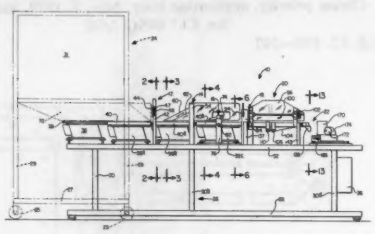
a. unloading means for continuously moving said containers from said hopper onto at least one track means, said track means being powered to move the unloaded containers to the apparatus stations;

b. a first station having a gate means positioned with respect to said track means so that said gate will permit only one layer of unloaded containers to travel onto subsequent apparatus stations;

c. a second station having orientation means, which orientation means includes spaced apart first and second contact

means, said first contact means having a contact portion closer to said first station than the contact portion of said second contact means, whereby a container having its long axis substantially misaligned with the direction of container travel will contact said first contact means contact portion prior to contacting said second contact means contact portion thereby, in conjunction with the movement of said powered track means, causing the misaligned container to move so that its axis is more in alignment with the direction of said container travel;

d. a third station having a gate means which has a closed position and an opened position, said third station gate,



when in the closed position, intermittently halting the travel of containers at said third station and, said third station gate, when it moves from said opened position to said closed position, striking containers which are hooked together at their necks or which are stacked on top of one another to effect separation thereof;

e. a fourth station having a gate means which has an opened and closed position, said fourth station intermittently halting the travel of containers at said fourth station; and

f. a fifth station having flip-over means for reversing containers, at said fifth station, which are traveling with their bottoms facing in a direction opposite the direction of travel.

4,328,888

CONVEYOR BELT SCRAPER BLADES

Richard F. Luke, Oxcroft Works, Boughton La., Clowne, Chesterfield, England

Continuation of Ser. No. 917,349, Jun. 20, 1978, abandoned.
This application Dec. 17, 1979, Ser. No. 104,098
Int. Cl.³ B65G 45/00
U.S. Cl. 198—499 **7 Claims**

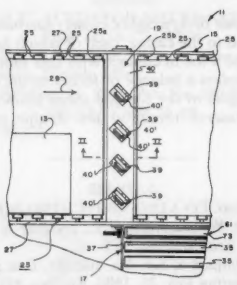
1. A conveyor belt scraper supporting arrangement comprising a conveyor belt scaper blade and a blade support arrangement, said conveyor belt scraper blade being of synthetic plastics or hard rubber material and of elongate form and generally trapezoidal cross-section, and including an elogate steel reinforcing and supporting strip of rectangular cross-section to provide two pairs of parallel faces extending parallel to the longitudinal axis of said blade and bonded thereto along at least three of said four faces and thereby at least partially embedded therein, said blade extending in opposite lateral directions beyond two peripheries of said strip to provide two longitudinally extending scraper edges adapted, in use, to make contact with a conveyor belt surface to be scraped, and said blade having a lateral dimension such that said scraper edges extend beyond respective adjacent lateral peripheries of said strip, said strip being apertured at at least two places along its length to provide a connection means for attaching the blade, in use, to said blade support arrangement and said blade support arrangement including resilient means for attachment of the scraper blade to rigid structure of the conveyor, said resilient means being in the form of first and second spring arms attached to said blade.

4,328,889

CONVEYOR MEANS

Wesley R. Maxted, 2135 Brierbrook, Germantown, Tenn. 38138

Filed Jul. 24, 1980, Ser. No. 171,805
Int. Cl.³ B65G 47/46
U.S. Cl. 198—367 **7 Claims**

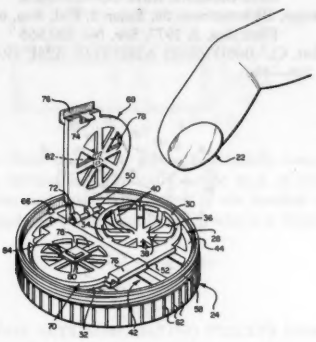


1. Conveyor means comprising a main conveyor means; a secondary conveyor means; an article diverting means for selectively diverting articles from said main conveyor means onto said secondary conveyor means; said main conveyor means including an article-supporting conveyor surface, said article-supporting surface of said main conveyor means having a transversely extending gap therein, said diverting means including a plurality of diverter wheels for being mounted in a single aligned row within said gap in said article-supporting conveyor surface of said main conveyor means, said gap being substantially the same width as said diverter wheels, said diverting means including support means for supporting said diverter wheels, said support means including a plurality of superstructure means for engaging said diverter wheels, each of said superstructure means including an upper end and a lower end, said upper ends of said superstructure means being located within and being no wider than said gap in said article-supporting conveyor surface of said main conveyor means, said support means including a substructure means for rigidly joining said plurality of superstructure means together; and an actuator means for selectively moving said diverter wheels between an operative position in which at least a portion of said diverter wheels extend above said article-supporting conveyor surface of said main conveyor means and an inoperative position in which no portion of said diverter wheels extends above said article-supporting conveyor surface of said main conveyor means; said actuator means including an arm member having a first end pivotally attached to the frame of said main conveyor means and having a second end, said substructure means of said support means being supported by said arm member intermediate said first and second ends thereof, said actuator means including a piston means attached to said second end of said arm member thereof for selectively causing said arm member to pivot between a first position in which said diverter wheels are in said operative position and a second position in which said diverter wheels are in said inoperative position.

4,328,890
CONTACT LENS CONTAINER

Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Sep. 2, 1980, Ser. No. 183,072
Int. Cl.³ A45C 11/04
U.S. Cl. 206—5.1 5 Claims



1. A container for use in storing corrective contact lenses emersed in a lens conditioning fluid, comprising; a shallow cup-like base having an open-end and a bottom panel opposite said open end; cap means for selectively closing the open end of said base; and lens basket means disposed in said base, said lens basket means including cage means having a rim with a pair of individual lens pocket means formed integral with said cage means and disposed in side-by-side relation interiorly of said rim, said lens pocket means having a central hub and spaced staves radiating from said hub to provide an open latice construction for said lens pocket means, said staves including substantially coplanar inboard portions adjacent said hub and abrubtly upturned outboard portions inclined from the plane of said inboard stave portions and at angle from about 70 to about 90 degrees for confining the contact lens element within said lens pocket means and against laterally slidable extraction of the lens element therefrom, said cage means further including a pair of integral hinged pintles with aperture cover means for said lens pocket means pivotally connected to said pintles, said cage means also including a plurality of chordal ribs joining said lens pocket means to said rim thereby providing an open latice construction about said lens pocket means, and said rim extending below said lens pocket means to engage said bottom panel thereby spacing said lens pocket means above said bottom panel whereby the open latice construction of said lens pocket means and said cage means, the aperture cover means and the spacing of said lens pocket means above said bottom panel all serve to promote the free flow of lens conditioning fluid to the lenses carried by said lens pocket means.

4,328,891
TAB SEPARATOR ELEMENT

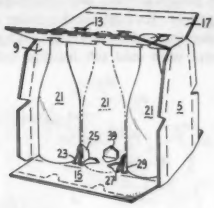
John R. Elward, Novato, Calif., assignor to Pacific Paperboard Products, Inc., San Francisco, Calif.

Filed Jun. 9, 1980, Ser. No. 157,798
Int. Cl.³ B65D 75/04
U.S. Cl. 206—158 5 Claims

1. In a side loading container carrier having a bottom wall and arranged for loading at least two label bearing containers, improved tab separator elements formed from said bottom wall said tab separator elements being employed in pairs with a container between said pair of tabs, comprising

a front section;

a rear section of sufficient height to interpose said label bearing containers, with neither said front section nor said rear section having a leading edge with any portion parallel to the leading edge of said label; and

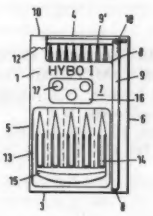


an arcuate fold line along which said front section and said rear section are joined to said bottom wall, said fold line being convex with respect to a container between said pair of tabs.

4,328,892
DENTAL HYGIENE CASE

Paul Heitlinger, Chemnitzer Strasse 15, 6054 Rodgau 3 (Nieder-Roden), Fed. Rep. of Germany

Filed Aug. 18, 1980, Ser. No. 178,693
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934047
Int. Cl.³ A45D 44/18; B65D 77/00
U.S. Cl. 206—229 7 Claims



1. A case-like container in form and size of the conventional cigarette package, having at least some walls constructed of a plastic material, for keeping items used in dental hygiene and operable by tearing off at least a portion of at least one wall of the container, in which a substantial portion of the container is in the form of a beaker around which there is disposed a toothbrush having at least one hinge, the toothbrush being contained within walls that can at least be partially torn off.

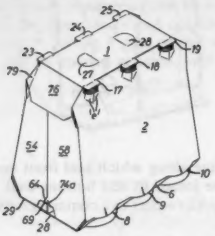
4,328,893
BOTTLE CARRIER

James R. Oliff, Austell, and Prentice J. Wood, Hapeville, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Oct. 15, 1980, Ser. No. 197,375
Int. Cl.³ B65D 5/02
U.S. Cl. 206—435 4 Claims

1. A wrap-around carrier for packaging bottles arranged in two adjacent parallel rows, said carrier comprising a top panel, a pair of side wall panels, and a pair of bottom panels hinged together to form a tubular structure in close contact with the bottles, a medial keel panel hinged to one of said bottom panels and disposed between the two rows of bottles, and a pair of end closure panels hinged to the end edges of respective side wall panels at at least one end of the carrier, said end closure panels having adjacent inner edges overlapped one behind the other when closed and including interengaging means for locking the end closure panels together, said interengaging means being provided by portions of said inner edges located adjacent

the medial keel and overlapped in a reverse order as compared to the remaining mutually overlapped areas of the end closure panels, and a locking notch formed in said medial keel for cooperating with said interengaging means to aid in holding said end closure panels closed, said interengaging means comprising an integral tab formed on the outer end closure panel and a locking zone formed by an oblique edge part of the inner end closure panel with said tab located behind said oblique



locking edge, and means for limiting relative sliding movement of said tab upwardly with respect to the oblique locking edge including an integral tab formed on the inner end closure panel immediately above said oblique locking edge and located behind the outer end closure panel, the inner edge of said inner end closure panel above said movement limiting tab being upwardly inclined such that the overlapped area of said inner end closure panel increases in a direction towards the top panel of the carrier.

4,328,894

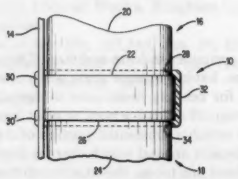
DISPLAY CLIP FOR SECURING CONTAINER SO AS TO PRECLUDE TAMPERING THEREWITH

Morton Edell, West Orange, N.J., assignor to Hazel Bishop Industries, Inc., Kenilworth, N.J.

Filed Jun. 26, 1980, Ser. No. 163,341

Int. Cl.³ B65D *73/00*

U.S. Cl. 206—461 **8 Claims**



1. A cosmetic container and display assembly comprising in combination:

a display card; cosmetic container; and display clip means; said cosmetic container and display clip means including cooperating portions retaining the container on said display card, restricting said container against movement away from said display card, and preventing unauthorized opening and access to the contents of said container, the improvement in which:

said cosmetic container comprises at least two, separable container parts which must be separated to gain access to the container contents,

each of said container parts respectively including built up separate abutment portions in proximity to each other when the container means is closed and its contents are not accessible, and said built up container parts projecting outwardly from the separable container parts,

said display clip means comprising a member having spaced flanges embracing the closed container parts and disposed in spaced relation at opposite sides of said built up abutment portions and abutingly preventing separation thereof while engaging said built up portions of said container parts whereby separation and unauthorized access to the contents of said container means is prevented.

4,328,895

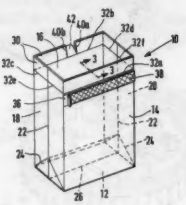
DISPOSABLE ASH CONTAINER

Klara Jaeger, Birkenstrasse 58, Essen 1, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 802,955

Int. Cl.³ B65D *73/00;* **A24D** *1/12;* **A24F** *19/00*

U.S. Cl. 206—496 **9 Claims**



1. A container for receiving ashes and cigarette and cigar butts, comprising: a flat-bottomed bag open at the top, made of substantially air-impermeable, plastically deformable, pliable sheet material having at least on its sides defining the interior of the bag a material surface substantially resistant to the embers of cigarette and cigar butts, the bag having a bottom adapted to support said container in an upright position on a surface and two confronting sidewalls of substantially the same height which are joined to one another and to the bottom in a substantially air-tight manner and merge at the open upper end of the bag with a peripheral marginal section, the sidewalls being superimposable on one another at least in the area adjacent the marginal section and being provided at the transition to the peripheral marginal section with a folding line or crease such that the peripheral marginal section can be bent to one side along the crease with plastic deformation of the sheet material, by at least 90° in relation to each of the superimposed areas of the sidewalls, whereby a substantially airtight closure of the interior of the bag from the environment is formed along the crease, and two substantially parallel cuts made downwardly from the top edge of the bag approximately to the folding line, and in which the tab of material remaining between the two cuts is adapted to be bent down at the crease for the formation of a cigarette rest.

4,328,896

WRAPPING MATERIAL AND METHOD OF FORMING WRAPPED PACKAGE

Jurgen Behne, Wolfersdorf, Fed. Rep. of Germany, assignor to Avon Products, Inc., New York, N.Y.

Continuation of Ser. No. 957,671, Nov. 6, 1978, abandoned, which is a division of Ser. No. 852,052, Nov. 16, 1977, abandoned. This application Dec. 16, 1980, Ser. No. 216,789

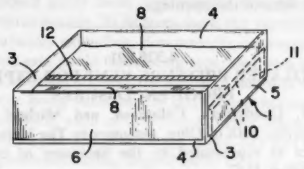
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653589; Nov. 25, 1976, 7637048[U]

Int. Cl.³ B65D *75/38, 85/16, 65/00*

U.S. Cl. 206—497 **12 Claims**

1. The combination of a carton or packing piece goods, said carton having a surface for supporting a plurality of said piece goods and opposed pairs of spaced, substantially parallel walls defining a space of predetermined size within which said piece goods are substantially confined; foldable, heat shrinkable material in the form of at least a foil sheet connected to said carton along a region adjacent each junction between said supporting surface and a wall of one pair of opposed sidewalls, said foil sheet having portions which extend toward a free and remote from said regions; and an indeterminate plurality of

piece goods of varying size at least to partially fill said space, said extending portions of said foil sheet are folded in overlapped relation about said piece goods, bonded together along the overlapped length and heat shrunk on to said piece goods



thereby to force said piece goods individually toward said supporting surface and physically locate each of said piece goods within said space irrespective of the number of piece goods packed and the amount of space which is filled.

4,328,897

RACK FOR ACCOMMODATING CIRCUIT BOARDS

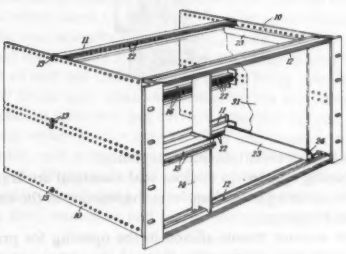
Harald Weiss, Bremen, Fed. Rep. of Germany, assignor to Vero Electronics GmbH, Bremen, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 91,945

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 7833194[U]; Nov. 8, 1978, 7833195[U]

Int. Cl.³ H02B *1/02*

U.S. Cl. 211—41 **4 Claims**



1. A rack for accommodating circuit boards, comprising two metal end plates, opposed pairs of upper and lower extruded metal tie bars fixed at their opposite ends to the end plates, and guide rails molded from plastics material which extend between the upper tie bars and between the lower tie bars in directions parallel to the end plates in opposed pairs, the guide rails being attached at the ends thereof to the tie bars and having grooves in the opposing faces thereof for accommodating the upper and lower edges of circuit boards slid endwise into the rack, each of said rear tie bars having a forwardly facing vertical face formed with regularly pitched slots for accommodating the rear ends of said guide rails, each of said front tie bars having a horizontal face formed with slots regularly pitched at the same pitch as the slots in the rear tie bars for accommodating the front ends of said guide rails, each guide rail having at the rear end thereof a projection capable of insertion into one of said slots in a rear tie bar to locate said guide rail vertically and capable of limited horizontal movement with respect to said tie bar, said guide rail also having at the front end thereof a deformable projection for entry into a slot in the opposed front tie bar, each front tie bar having adjacent each slot therein a portion operative to deform said deformable projection as it enters said slot and thereafter to locate said guide rail horizontally.

4,328,898

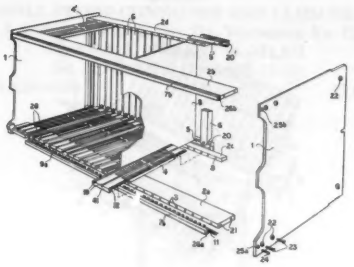
FRAME FOR STORING PRINTED-CIRCUIT BOARDS OR THE LIKE

Francesco Grassi, Milan, Italy, assignor to Societa' Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Dec. 4, 1979, Ser. No. 100,268

Int. Cl.³ H02B *1/04, 1/02;* H05K *7/18*

U.S. Cl. 211—41 **8 Claims**



1. A frame for the parallel storage of a multiplicity of flat articles, comprising:

a pair of spaced-apart end walls;

a first and a second pair of elongate cross-members with coplanar supporting surfaces interconnecting said end walls, the supporting surfaces of said pairs confronting each other and being spaced apart by a distance exceeding a dimension of said articles perpendicular thereto;

a first and a second set of guide elements respectively spanning the cross-members of said first and said second pair along their supporting surfaces, respective guide elements of said sets being provided with confronting track channels for receiving opposite edges of an article to be inserted therebetween, said guide elements and said cross-members being provided with interlocking formations enabling separation thereof by a displacement transverse to said cross-members; and

first and second retaining bars paralleling adjoining faces of respective cross-members of said first and second pairs for preventing said transverse displacement, thereby holding said guide elements engaged with said cross-members, said formations including a multiplicity of perforations on said faces and projections on overhanging portions of said guide elements protruding between said bars and said faces, said overhanging portions extending over not more than half the width of said faces, said projections occupying not more than half the cross-sections of said perforations for enabling engagement of said cross-members by a further, symmetrical set of guide elements on opposite surfaces of said cross-members.

4,328,899

CROCKERY AND GLASSWARE STAND

Kurt Krusche, Nansenring 22, 6000 Frankfurt, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,435

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1980, 8008973[U]

Int. Cl.³ A47G *19/08;* A47F *7/00, 5/10*

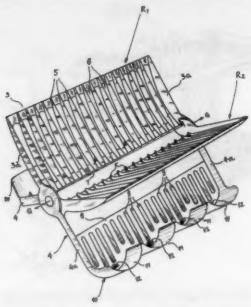
U.S. Cl. 211—41 **6 Claims**

1. A crockery and glassware stand comprising:

two generally identical cooperating rectangular frame parts hinged together at a hinge connection about a longitudinally extending axis and adapted to hinge between an open, generally X-shaped configuration position and a closed, generally parallel configuration position, each of said frame parts having upper and lower portions respectively extending above and below said axis, and first and second ends;

each of said upper frame portions having spaced parallel ribs connected together near said hinge axis by struts extending generally parallel to said axis to provide insertion slots for crockery, said frame parts adapted to support crockery in cooperating, generally aligned insertion slots when in said open position;

each of said lower frame portions having end formations and an interconnecting means for joining said end formations,



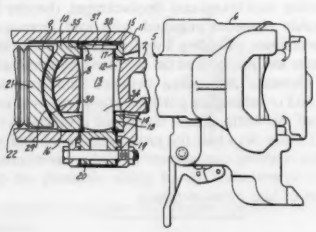
said interconnecting means having primary drainage hols therein, and a supporting base portion connected to said end formations and said interconnecting member and extending substantially perpendicuarly out from said interconnecting members, said base portion having undulations adated to provide generally upwardly opening recesses for receiving and separating individual glassware items.

4,328,900

ROTARY COUPLER WITH IMPROVED PIN BEARING

Richard M. Hanula, Lyndhurst, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sep. 12, 1980, Ser. No. 186,475
Int. Cl.³ B61G *9/00*
U.S. Cl. 213—62 A **8 Claims**



1. A rotary railroad car coupler, comprising:

(a) a coupler head having a shank extending therefrom and terminating at a butt end, the shank having a pinhole extending transversely therethrough adjacent the butt end;

(b) a rotary connector rotatable about an axis and having a pair of opposing sides which at least help form a pocket for receiving the butt end of the coupler shank, the sides having aligned openings which are alignable with the pinhole in the coupler shank when the butt end of the shank is properly inserted in the pocket;

(c) at least a pair of opposing support abutments restricting the opening in at least one of the opposing sides of the connector; and

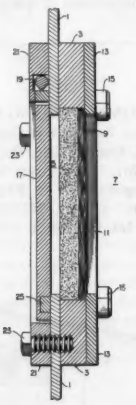
(d) a pivot pin insertable in the openings of the rotary connector and the pinhole for mounting the coupler shank to the rotary connector, the pivot pin being formed by at least two concentric cylindrical pin portions which are of different diameters and which extend into the openings and which form between them an annular stop which contacts the abutments in the rotary connector, the different diameter pin portions designed to bear against adjacent sides of the openings.

4,328,901

MULTILAYER PRESSURE VENT FOR EXPLOSION PROOF ENCLOSURES

Robert J. Gunderman, Columbus, and Michael W. Riley, Strongsville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 5, 1980, Ser. No. 213,446
Int. Cl.³ B65D *25/00*
U.S. Cl. 220—88 A **9 Claims**



1. A pressure vent device comprising:

a housing adapted to enclose said electrical apparatus;

a vent opening extending from the interior to the exterior of the housing;

flame arrestor means affixed in the opening for preventing flames from propagating through the opening in the event of an explosion of gas to vent through the opening at a predetermined pressure, said flame arrestor means including a multilayered material consisting of a metallic foam material adjacent to a plurality of metallic mesh screens;

the enclosure including a seat surrounding the opening on the exterior side of the flame arrestor means;

a cover sized and shaped to close the opening and fit against the seat for protecting the flame arrestor means;

hinge means for connecting one edge portion of the cover to the enclosure while permitting an opposite edge portion to swing away from the seat;

releasable latch means for holding said opposite edge portion against the seat until a predetermined pressure is reached in the enclosure; and

closing means for automatically returning said opposite edge portion into contact with the seat after the enclosure pressure drops below said predetermined pressure.

4,328,902

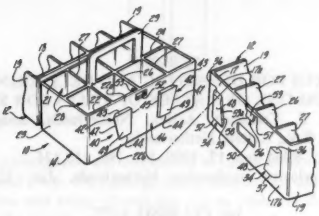
BEVERAGE CARRIER

Thomas M. North, 3455 Whitfield, Waterford, Mich. 48095

Filed Nov. 20, 1980, Ser. No. 208,571
Int. Cl.³ B65D *21/02*
U.S. Cl. 220—23.4 **3 Claims**

1. A beverage carrier assembly comprising: a pair of identi-

cal end bottle transporting carriers and a center bottle transporting carrier; each said end carrier being substantially box-shaped having bottom, side and end walls, each said side wall having an exterior surface provided with a pair of mirror image, block-like shoulder members, said shoulder members having opposed guide faces downwardly tapered at a draft angle of approximately 30 degrees from the vertical so as to define a vertically extending, downwardly converging, angular-sided slot, said guide faces being separated by a horizontal distance no less than one-half the length of said side walls; said center carrier being substantially box-shaped having bottom, side and end walls, each of said center carrier sidewalls being provided with a pair of mirror image, block-like half key members having outward-facing, angled spline faces of said half key members being aligned to interlockingly engage the guide



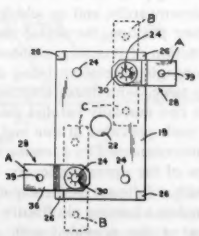
faces of said end carrier shoulder members; said end carriers and said center carrier each including handle means; said center carrier being moveable downwardly between a pair of end carriers oriented in side-by-side predetermined spaced array to cause said spline faces of said center carrier to interlockingly engage the corresponding guide faces of said shoulder members of said end carriers to form a dovetail interlocking structure; each of said end carrier handle means being operative to be grasped by the user when said center carrier is in interlocking engagement with said end carriers whereby the end carriers and said center carrier may be lifted and transported as a unit assembly, said center carrier being separable from said end carriers by the lifting said center carrier upwardly by its handle means thereby disengaging said center carrier half key members from their associated end carrier shoulder members.

4,328,903

WEATHERPROOF JUNCTION BOX

George J. Baars, 18 Wimpole Way, Green Brook, N.J. 08812

Filed Feb. 29, 1980, Ser. No. 125,759
Int. Cl.[3] H02G *3/08*
U.S. Cl. 220—3.7 8 Claims



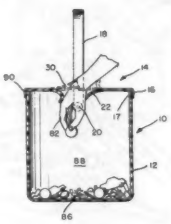
1. An electrical junction box comprising:
a housing having bottom, top, side and back walls for defining a cavity;
at least one of said bottom, top, side and back walls having a threaded opening therethrough;
a plurality of posts formed on the external surface of the back wall;
lug means for mounting said box to a support, said lug means rotatably received on said plurality of posts; and
push nut means rigidly secured to said posts for retaining said lug means on said posts.

4,328,904

SPILL PROOF CONTAINER AND CLOSURE

Elaine J. Iverson, R.F.D. 2, Box 231, Warrenton, Va. 22186

Filed Feb. 3, 1981, Ser. No. 231,172
Int. Cl.[3] B65D *51/18*; A45C *11/00*
U.S. Cl. 220—256 27 Claims



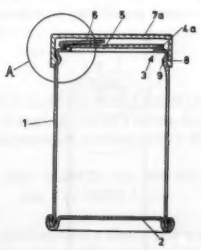
1. A spill proof closure comprising:
a peripheral support surface defining a planar closure area; and
at least two resilient, flexible flaps mounted to said support surface, said flaps substantially covering said planar closure area, each of said flaps having an unsupported nonlinear edge, said flaps being overlapped and forming at least one overlapping area defined by said unsupported nonlinear edges, edge of said unsupported nonlinear edges intersecting said peripheral support surface at two intersection points, the nonlinearity of said unsupported nonlinear edges being so configured as to optimize the overlap area to provide an enhanced seal.

4,328,905

METAL CAN WITH MEMBRANE TYPE CLOSURE

Jean Hardt, Benken, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 25, 1981, Ser. No. 237,856
Claims priority, application Switzerland, Mar. 25, 1980, 2305/80
Int. Cl.[3] B65D *51/22*
U.S. Cl. 220—258 11 Claims



1. A can having a bottom, a substantially cylindrical side wall and an opening sealed by a membrane, said opening being bounded by a flange formed by said side wall at an angle substantially perpendicular to the plane of said side wall, said flange including a first straight portion extending from said side wall in a first direction substantially perpendicular to the

plane of said side wall, an upwardly directed curl portion extending from said first straight portion and a second straight portion extending from said upwardly directed curl portion in a second direction opposite said first direction such that said first straight portion and said second straight portion are substantially parallel with respect to each other whereby said membrane seals on said second straight portion.

4,328,906

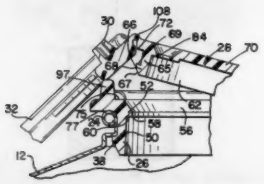
CONTAINER AND CLOSURE THEREFOR

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., Oak Brook, Ill.

Filed Nov. 24, 1980, Ser. No. 209,556

Int. Cl.³ B65D *51/16, 39/00*

U.S. Cl. 220—260 **13 Claims**



1. A closure for a container having a wall member with an aperture,

said closure comprising a sleeve member having a seal-tight fit within said aperture and having a bore providing a pour opening,

a flexible plastic plug having a seal-tight fit within said opening,

a lift lever connected to said plug, and a combination pour lip and fulcrum projecting from one of said members for fulcruming engagement by said lever upon lifting and tilting thereof to thereby open said pour opening by lifting the plug out of the pour opening.

4,328,907

DISPENSER FOR INDIVIDUAL MOISTENED PAPER TISSUES FROM A LENGTH THEREFOR PERFORATED AT INTERVALS

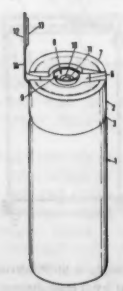
Michael J. Beard, Blackwater, England, assignor to Medi-Pack Limited, Surbiton, England

Filed Dec. 7, 1979, Ser. No. 101,082

Claims priority, application United Kingdom, Jan. 2, 1979, 7900030

Int. Cl.³ B65H *1/00*

U.S. Cl. 221—63 **2 Claims**



1. A dispenser from which may be pulled individual, moist, non-woven fabric wipes comprising a container body, a linked succession of said moist, non-woven fabric wipes located generally within said container body, a container lid removably attached over an open upper end of said body, a wall surrounding the central portion of said lid, which said central portion includes an orifice to receive the end wipe in said succession of wipes, said orifice having both a fixed length and a fixed breadth and approaching at its edges a surrounding wall and a lid located at the upper edge of said surrounding wall to close said orifice between dispensations, the upper surface of said lid having two areas, one to each side of said orifice for lid-retaining finger pressure when a wipe protruding from said orifice is pulled and spaced apart to define a marking indicating a preferred direction of pull.

4,328,908

APPARATUS FOR DENESTING AND DELIVERING THE BOTTOM ONE OF A STACK OF TRAYS FOR EGGS

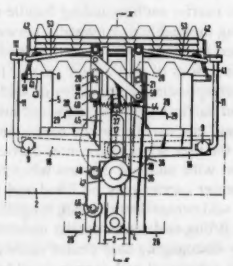
Leonardus J. Temming, Aalten, Netherlands, assignor to Staalkat B.V., Aalten, Netherlands

Filed Jan. 17, 1980, Ser. No. 113,124

Claims priority, application Netherlands, Jan. 22, 1979, 7900502

Int. Cl.³ B65H *3/22*

U.S. Cl. 221—213 **3 Claims**

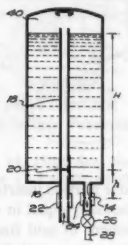


1. Apparatus for mechanically denesting and delivering the bottom one of a nested stack of trays for eggs or the like, each including a plane web portion and projections extending upwardly and downwardly from said web portion, which projections engage with each other during nesting, said apparatus comprising a table vertically movable up and down relative to a frame and carrying tray engaging members for engaging with downwardly extending projections of the bottom tray and for pulling the same downwardly, and on which table, just before it reaches its highest position, the nested stack comes to rest owing to the retraction of retaining members, control of the first set of tray engaging members being derived from the movement of the table, with these tray engaging members being mounted on two mutually parallel shafts located in the central part, and each provided at one end with two-armed operating levers interconnected by a tension spring which acts on the lower arms of the operating levers, one of said arms being provided with a follower roller capable of cooperting with a lever pivoted to a bearing pin fixedly connected to the frame, which lever is also provided with a follower roller capable of cooperating with a cam rotatably connected to the frame and driven by a motor, the opposite operating lever being movable in opposite direction via a diagonal rod, and a second set of tray engaging members rotatably connected to the table and arranged to engage with the peripheral edge of the tray to be released.

4,328,909
CONTAINER FOR DISPENSING LIQUID UNDER CONSTANT HEAD

Edward L. Jeans, Ledbury, England, assignor to Cadbury Schweppes Limited, London, England

Filed Feb. 27, 1980, Ser. No. 125,287
Claims priority, application United Kingdom, Feb. 28, 1979, 7907048
Int. Cl.³ B67D 5/28
U.S. Cl. 222—54 12 Claims

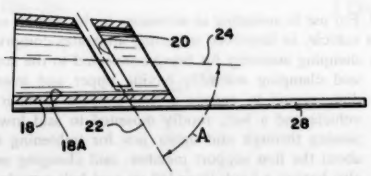


1. A package for the dispensing of liquid comprising a wall, a base and a top, the package being adapted for use in inverted condition and being closed but for an outlet in the top from which the liquid can flow under gravity and an inlet through which air can bleed to compensate for liquid which flows from the package, said inlet comprising a bleed tube extending from the base of the container to a position close to the top of the container, said bleed tube open to the atmosphere at the base of said container and open to the inside of the container near the top thereof and the tube having a one-way valve arrangement in the wall thereof adjacent the base of the container, said one-way valve arrangement permitting passage of air only in a direction from inside said container, through said valve to the inside of said tube, so that, in use, air in the head space in the container can be vented through the one-way valve arrangement in the event that the temperature of the air in said head space increases, but flow of air into said head space other than by bleeding through the vent tube is prevented so that dispensing of the liquid from the container will always be under a constant head.

4,328,910
DEVICE FOR CUTTING CAULKING NOZZLES

Richard H. Polite, Jr., 5024 E. 2nd St., Tulsa, Okla. 74112

Filed May 5, 1980, Ser. No. 146,514
Int. Cl.³ B67B 7/24
U.S. Cl. 222—81 5 Claims



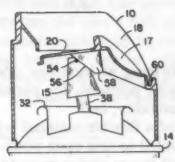
1. For use with a caulking tube having an integral tapered tubular nozzle of resilient material extending therefrom, a device for use in trimming the tip off the nozzle comprising:

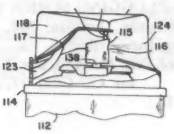
a tubular body of internal dimension to telescopically receive the tapered tubular nozzle of a caulking tube and thereby slidable onto a caulking tube nozzle a preselected distance past the nozzle tip, the body having a slit therein in a plane through the body tubular wall past the body tubular axis, the slit being of a width to slidably receive a knife blade whereby a blade may be guided to cut the nozzle at the angle of the slit.

4,328,911
CHILD RESISTANT AEROSOL ACTUATING OVERCAP

Michael G. Knickerbocker, Crystal Lake, Ill., assignor to Seaquist Valve Company, Cary, Ill.

Filed Jul. 23, 1980, Ser. No. 171,357
Int. Cl.³ B65D 83/14, 55/12
U.S. Cl. 222—182 14 Claims





1. A child resistant assembly for use with an aerosol container having a valve for discharging an aerosol product upon opening the valve, comprising in combination:

an actuator button having a terminal orifice;

a valve stem connecting said actuator button with the valve for enabling discharge of the aerosol product from said terminal orifice upon movement of the valve;

an overcap secured to the aerosol container for at least partially covering said actuator button;

a finger actuator movably mounted relative to said overcap;

an engaging surface disposed on one of said actuator button and said finger actuator for cooperation with non-symmetrical means on the other of said actuator button and said finger actuator; and

means for rotationally mounting said finger actuator relative to said actuator button for enabling said engaging surface to contact said non-symmetrical means upon the finger movement of the operator to open the valve only upon selected orientation of said finger actuator relative to said actuator button.

4,328,912
SELF-CONTAINED VALVED PACKAGE

Theodore Haggar, deceased, late of Totowa, N.J., and by Phyllis Haggar, administratrix, 5 Artillery Park Rd., Totowa, N.J. 07512

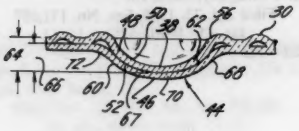
Filed Jun. 26, 1978, Ser. No. 919,316
Int. Cl.³ B05B 11/04
U.S. Cl. 222—212 12 Claims

1. A dispensing package for a fluent commodity comprising

a collapsible tube with a self-contained depression/impression valve formed from two wall portions thereof (in the wall of said collapsible tube) operable between an open position and a closed position for discharging said commodity, (and) further comprising:

a depression in the first one of said wall portions operable between a smooth-curved position and a multiply curved position;

an impression in the second one of said wall portions which when said depression is in the smooth-curved position, mates with and seals against said depression for preventing discharge of said fluent commodity, and, which when said depression is in the multiply curved position said second one of said wall portions is operated to a multiply curved



position forming at least one opening between the two opposed wall portions, for permitting discharge of said fluent commodity; and

said wall is of a flexible material whereby upon said valve being operated to said open position, momentary pressing of said wall forces said commodity through said valve.

4,328,913

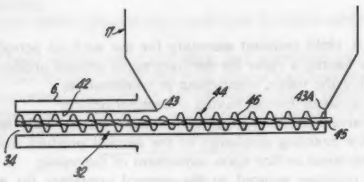
NON-PLUGGING SCREW CONVEYER

Patrick W. Whiteman, Lothian, Md., assignor to Recycled Paper Bedding, Inc., Arlington, Va.

Filed Feb. 29, 1980, Ser. No. 125,841

Int. Cl.³ G01F 11/20

U.S. Cl. 222—413 **4 Claims**



1. In apparatus for conveying cellulosic animal bedding which comprises a hopper having a bottom discharge opening in combination with a screw conveyor, the bottom of the hopper being connected at a downstream end connection and at an upstream end connection to a close fitting conveyor tube, said screw conveyor including a rotatable flight auger having a plurality of turns and extending from beneath the discharge opening of the hopper into the close fitting conveyer tube, wherein the auger flight extends a predetermined radial height, the improvement which comprises a reduction in the radial height of only those turns of the auger flight immediately upstream and immediately downstream of the downstream end connection.

4,328,914

VEHICLE MOUNTED CARRIER ASSEMBLY

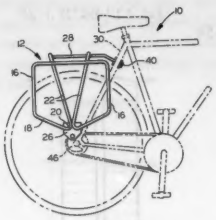
Reginal O. Michaud, 769 Maple St., Wethersfield, Conn. 06109

Filed Dec. 29, 1980, Ser. No. 220,418

Int. Cl.³ B62J 9/00

U.S. Cl. 224—31 **13 Claims**

1. A carrier assembly for affixing to a wheeled vehicle, comprising a supporting rack and carrier means disengageably mounted thereon; said supporting rack including a mounting bracket, a stabilizing member, and a freestanding frame portion having a longitudinally extending upper support element; said bracket being adapted for affixing to the vehicle at a point adjacent the axle of one of its wheels and being joined to a lower part of said frame portion to dispose said frame portion upwardly therefrom when said bracket is so affixed, and said stabilizing member being adapted for affixing to the vehicle at a location spaced from said point of affixing of said bracket to constrain said rack against pivotal displacement thereabout; and carrier means having a sleeve portion closed at the top and sides and open at the bottom, said sleeve portion providing a generally rectangular recess dimensioned and configured to correspond to said frame portion of said rack and to slidingly



and snugly seat said frame portion inserted upwardly thereinto, said recess being substantially equal in width to the length of said upper support element of said frame portion, with said rack thereby providing secure underlying support for said carrier means, said bracket and said stabilizing member being so disposed on said rack as to avoid interference with the mounting of said carrier means thereupon.

4,328,915

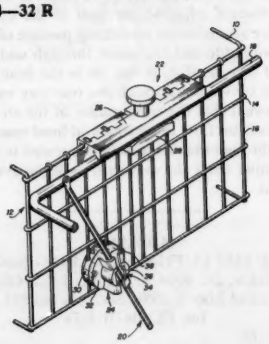
UNIVERSAL QUICK RELEASE MOUNTING ASSEMBLY

Warren J. Melton, III, 5020 Amesbury, #2062, Dallas, Tex. 75206

Filed Jul. 14, 1980, Ser. No. 168,545

Int. Cl.³ A61G 7/06

U.S. Cl. 224—32 R **8 Claims**



1. For use in mounting an accessory to the support members of a vehicle, an improved mounting apparatus comprising:

a clamping assembly for being connected to the accessory, said clamping assembly having upper and lower jaws dimensioned to engage a first support member of the vehicle and a bolt, rigidly mounted to said lower jaw, passing through said upper jaw for tightening the jaw about the first support member, said clamping assembly also having a knob threaded on said bolt outside of said upper jaw compressing and releasing said jaws about the first support member; and

a releasable locking assembly for being connected to the accessory adapted to receive and engage a second support member, said locking assembly having a pair of coaxially aligned discs adapted to interlock with one another in a plurality of rotational positions, said first disc being rigidly connected to the accessory and interlocking with said second disc, said second disc having a channel defined on

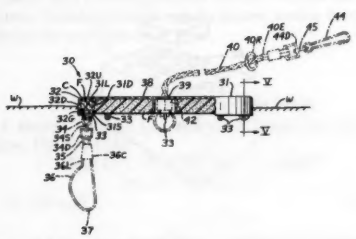
the noninterlocking surface thereof for receiving the second support member, one end of said channel having a first slot formed in the sidewall thereof oriented obliquely toward the channel, the other end of the channel having a second slot formed in the opposite sidewall of the channel oriented obliquely toward the channel, said first and second slots configured to engage the second support member when said locking assembly is rotated relative to the vehicle, said channel also having third and fourth slots formed in the sidewall thereof opposite said first and said second slots, said third and fourth slots being obliquely angled to the channel at the same angle as said first and said second slots.

4,328,916

FISH RINGER

Donald K. Lucas, 7849 Delisle Fourman Rd., Arcanum, Ohio 45304

Filed Feb. 14, 1980, Ser. No. 121,398
Int. Cl.³ A01K *65/00*
U.S. Cl. 224—103 **17 Claims**



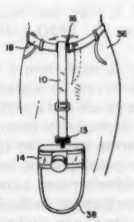
1. A fish stringer, comprising, in combination, a circular ring made of molded rigid plastic and including a radially outwardly extending flange integral therewith, means defining a plurality of openings through the rigid plastic of said flange having a snap hook secured thereto at each opening, a bar U-shaped in cross-section extending diametrically and integrally with said ring of rigid plastic a further ring element fitted complementary to said flange in a chamber defining relation thereto and a rope movably connected centrally of said bar.

4,328,917

HOLD STEADY STRAPS

Christiaan Reeberg, 111-67 145 St., Jamaica, N.Y. 11435

Filed Dec. 31, 1980, Ser. No. 221,618
Int. Cl.³ G03B *17/00*
U.S. Cl. 224—254 **1 Claim**



1. A hold steady strap assembly for a camera user having a belt, comprising

a longitudinal strap composed of woven elastic stretch fabric material that can be stretched longitudinally to a certain extent whereupon it becomes non-elastic yet returns to its original length when released,

a sliding buckle attached to one end of said elastic strap and slidable on an intermediate portion thereof so as to form an adjustable loop at the lower end of said strap,

a flat ring attached to the upper end of said strap, provided with a freely rotatable screw to fit a camera threaded opening, and

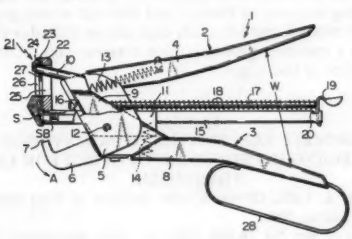
a hook having a base carried by said loop at the lower end of said strap, adapted to fit under the user's belt with said base located behind such belt so that the strap loops over the top of said belt when the strap is pulled forwardly or downwardly with respect to such belt, locking said hook on such belt, in which said strap also serves as an elastic hold down link between the user's belt and the camera when carried by a camera neck strap by the user, permitting the user to jog, exercise, run or ride a bicycle or motorcycle, or a horse, without damaging the camera by virtue of the "give" afforded by the elasticity of said hold down link.

4,328,918

STOP FIXING DEVICE FOR SLIDE FASTENER

Hiroshi Yoshida, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 21, 1979, Ser. No. 96,568
Claims priority, application Japan, Nov. 25, 1978, 53-145608; Nov. 25, 1978, 53-145609; Nov. 25, 1978, 53-162217[U]
Int. Cl.³ B25C *5/04*
U.S. Cl. 227—83 **3 Claims**



1. A stop fixing device for a slide fastener comprising:

an upper lever having a die portion at the forward end thereof;

a lower lever having an actuator at the forward end thereof;

an elongated guide member defining an elongated channel therein for slidably receiving a band of stops;

a pivot for connecting said levers and the guide member for rotation relative to each other with the guide member between the two levers;

spring means angularly biasing the two levers from the guide member;

a follower received in the guide member for forwardly urging the stop band loaded therein;

a driving mechanism having a driver guide channel communicating with the forward end of said elongated channel in the guide member so as to receive the leading stop of the stop band and a driver being engaged by said actuator and being received in said driver guide channel for movement therein when actuated by said actuator, the device being so arranged that upon squeezing the levers together, the leading stop of the stop band is compressed between said driver and said die portion of the upper lever, the improvements comprising:

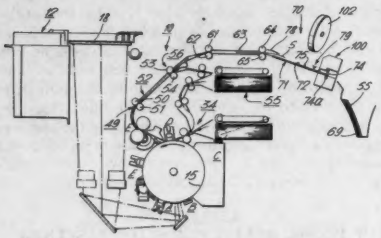
means for controlling the opening spread angle of said levers including a regulator plate, means for adjustably mounting said plate on one of said two levers and a stopper surface on the other lever being engaged by said plate for controlling the opening spread angle of the levers.

4,328,919

IMPROVEMENTS IN AND RELATING TO STITCHERS

Brian R. Lawrence, Olney, and Peter M. Downing, Maidenhead, both of England, assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1979, Ser. No. 106,197
Claims priority, application United Kingdom, Dec. 29, 1978, 50327/78
Int. Cl.³ B25C 5/04; B27F 7/19
U.S. Cl. 227—155 4 Claims



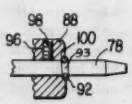
1. A wire stitcher for binding a set of sheets having a driver for driving a staple through a set, and an active clincher for bending over the ends of the staple legs to form clinches, the improvement wherein the clincher includes a clincher ear having a first groove for catching the end of the staple and initiating bending of the leg and a second narrower groove contiguous with said first groove for aligning the leg and completing the bending thereof, said first and second grooves are respectively formed in a side edge and an end edge of said ear with a transition groove portion between said grooves at the junction of said edges.

4,328,920

PORTABLE ELECTRONICS REPAIR SYSTEM INCLUDING IMPROVED DESOLDERER FOR USE THEREWITH

Alexander J. Vella, Derwood, Md., assignor to Pace Incorporated, Laurel, Md.

Division of Ser. No. 24,050, Mar. 26, 1979, abandoned. This application Mar. 13, 1980, Ser. No. 130,018
Int. Cl.³ B23K 3/02
U.S. Cl. 228—20 48 Claims



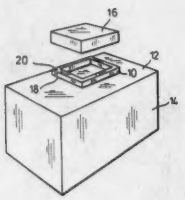
1. A portable electronics repair system comprising
a portable container;
a vacuum source disposed within said container;
an electrical power source; and
a desolderer responsive to said electrical power and vacuum source, said desolderer including
a heating wire energized by said electrical power source;
heating wire support means for supporting said heating wire;
a tubular sleeve, said heating wire and the support therefor being disposed in the tubular sleeve;
a tubular desoldering tip extending into said tubular sleeve, said desoldering tip being in communication with said vacuum source and being heated by said heating wire via the heating wire support means,
a hollow handle, said tubular sleeve being mounted on the forward end of said handle;
a tubular solder collection chamber disposed within said handle;
a seal disposed between said solder collection chamber and said tubular sleeve to thereby establish a first sealing relationship between the tubular sleeve and the seal and a second sealing relationship between the solder collection chamber and the seal; and
electrical connecting means adapted to connect said heating wire to a source of electrical energy, said electrical connecting means being sandwiched firmly between said seal and said tubular sleeve as it passes from the inside of said tubular sleeve to the outside of said solder collection chamber.

4,328,921

ATTACHMENT OF SOLDER PREFORM TO A COVER FOR A SEALED CONTAINER

Shou C. Liang, Spokane, Wash., assignor to Cominco Ltd., Vancouver, Canada

Filed Jun. 2, 1980, Ser. No. 155,025
Int. Cl.³ B23K 1/14
U.S. Cl. 228—222 13 Claims



1. A method of attaching a preformed solder ring to a cover of a container which method comprises placing said solder ring on a flat surface of a cooling block formed of a material to which the solder does not bond, placing said cover on top of said solder ring with alignment of respective peripheral edges, heating said cover to a temperature above the melting point of the solder while maintaining said cooling block at a temperature below the melting point of the solder wherein a substantial portion of the upper face of the solder ring melts while said cooling block keeps the temperature of the lower face of the solder ring below the melting point of the solder, said molten solder flowing into binding contact with contiguous portions of said cover, and cooling said solder ring to solidify said molten solder, thereby providing a cover assembly comprising said cover with said solder ring attached.

4,328,922

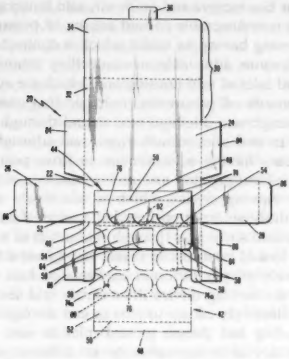
ARTICLE CARTON WITH SEPARATING PARTITION

Seiichiro Hirata, Mitaka, Japan, assignor to Kliklok Corporation, Greenwich, Conn.

Filed Jul. 2, 1980, Ser. No. 166,687
Int. Cl.³ B65D 5/48
U.S. Cl. 229—27 8 Claims

1. An article carton formed from a single sheet blank of foldable material, and having in assembled form, a bottom panel, a rear panel, side panels and a partially open front panel, all said panels being respectively interconnected along fold lines, the assembled carton having an open top, a composite panel including a top panel portion and front closure flap hingedly attached to said rear panel, a composite article spacer and positioning partition member in the interior of said carton integrally formed with the carton, said partition member being configured to provide a plurality of horizontally spaced article spacing compartments in said carton, a vertical web portion on said partition member operatively engaged with said bottom panel at an intermediate location between said front and rear panels, said partition member being connected along a first fold

line with said vertical web adjacent said intermediate location in said carton and a second fold line along said partially open



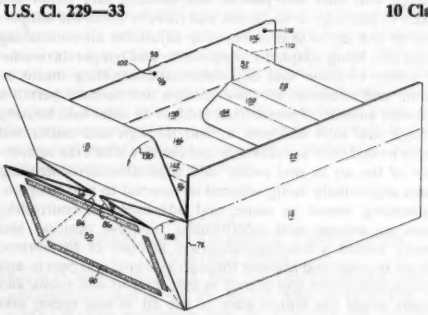
front panel, said partition member and the vertical web thereof conjointly forming interior reinforcement means for said carton along the partially open front.

4,328,923

PICNIC COOLER CONTAINER

Earl J. Graser, Monroe, La., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Oct. 22, 1979, Ser. No. 86,867
Int. Cl.³ B65D *5/24*
U.S. Cl. 229—33 **10 Claims**



1. A production blank for forming a picnic cooler having a lower beverage can or bottle retaining area and an upper ice retaining area when formed into a complete package, comprising:

(1) the lower beverage can or bottle retaining area formed with:

a. a bottom panel having a plurality of side edges:

b. a pair of opposed lower end panels hingedly attached to two opposed side edges of the bottom panel:

c. a pair of side panels hingedly attached to the remaining two opposed side edges of the bottom panel;

d. means, associated with the lower end panels and the side panels for joining the panels together; and

(2) the upper ice retaining area is formed with;

a. a pair of top side flaps hingedly attached to each side panel;

(1) a first inner glue flap hingedly attached to one of the top side flaps, the first inner glue flap comprising a first elongated panel and a first pair of triangular shaped panels and having hingedly attached thereto on each side thereof a first top gusset panel;

(2) a top end flap hingedly attached to each first top gusset panel;

[a] an upper end panel hingedly attached to one side of each top end flap; the upper end panels forming a part of the lower retaining area whenever the blank is formed into a package;

(3) a second pair of triangular shaped panels hingedly attached to the other side of each top end flap;

(4) a second elongated panel hingedly attached to the pair of second triangular shaped panels;

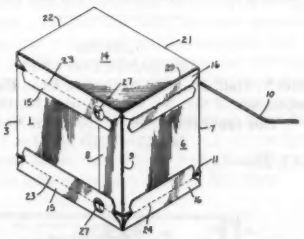
[a] an irregular shaped panel hingedly attached to each of the first and second elongated panels; one side of each of the two irregular shaped panels terminating opposite each other and spaced apart to form a central I-shaped panel which is hingedly attached on one side thereof to the first elongated panel and on the other side thereof to the second elongated panel; the two top side flaps in combination with the two top end flaps and the first and second inner glue flaps serving as a part of the upper ice retaining area whenever the production blank is formed into a complete package; the elongated panels and the irregular shaped panels serving as a removable cover to cover the tops of the cans or bottles packed in the cooler.

4,328,924

ARTICLE CONTAINER

Robert G. Neff; Garth H. Miller, both of Cincinnati; Denson C. Pate, Jr., New Richmond, all of Ohio, and John L. Williams, Jr., Atlanta, Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 12, 1981, Ser. No. 224,034
Int. Cl.³ B65D *5/68*
U.S. Cl. 229—43 **10 Claims**



1. An article container comprising a pair of spaced side walls and a pair of spaced end walls joined together to form a sleeve, at least one closure cap disposed perpendicular to said side and end walls and in coincidence with an opening of said sleeve, said closure cap having an attachment flap foldably joined to at least one edge thereof, said attachment flap being disposed in overlapping relationship with the associated outer surface of one of said walls and being secured thereto along a part thereof remote from said closure cap, a tear strip intermediate said one wall and said attachment flap and engageable with said attachment flap in the area thereof between said part and said closure cap, said tear strip extending substantially the length of said attachment flap, and an access aperture formed in said attachment flap.

4,328,925

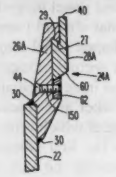
HARD SURFACING FOR A CENTRIFUGE CONVEYOR

Leonard Shapiro, Upper Darby, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 877,056, Feb. 13, 1978. This application Mar. 31, 1980, Ser. No. 136,123

Int. Cl.³ B04B *3/04*

U.S. Cl. 233—7 **18 Claims**



1. Improved hard surfacing for a helically formed, metal screw conveyor of a centrifuge, said conveyor extending in radial direction along a line between its rotational axis and its distal surface, said conveyor being rotatable transverse to said radial line about said axis, comprising:

a. a preformed backing member made of a metal which is weldable to said conveyor,

b. a preformed wear-resistant member,

c. means securing at least one wear-resistant member to said backing member to provide a unitary subassembly which is subsequently mounted on the conveyor, with male and female formations on the respective members interengaging at a surface between them which, in use, extends along a helical line about said axis generally following the distal edge of said conveyor, said formations holding said wear-resistant member against movement in radial direction,

d. said wear-resistant member having a distal portion extending in radial direction substantially beyond the distal surface of said conveyor,

e. said backing member being welded to said conveyor, with said backing member extending between said conveyor and said wear-resistant member in radial direction substantially beyond the distal surface of said conveyor, the distal portion of said wear-resistant member being braced by said conveyor through said backing member against deflection in axial direction toward said conveyor.

4,328,926

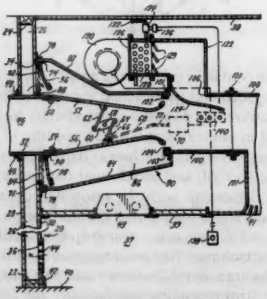
AIR-HANDLING UNIT

William K. Hall, Jr., 4350 N. Central Exp., Dallas, Tex. 75206

Continuation of Ser. No. 907,682, May 19, 1978, abandoned. This application Nov. 7, 1980, Ser. No. 204,901

Int. Cl.³ G05D *23/13*

U.S. Cl. 236—13 **13 Claims**



5. An air-handling unit which is connectable to a source of pressurized cold air, which is connectable to an inlet to a room that is to have the air therein conditioned, which can communicate with a second source of air, and which comprises a housing that can receive and guide air, said housing having an inlet which is connectable to said source of pressurized cold air, said housing having an outlet which is connectable to said inlet to said room, adjustable air-controlling means which are adjacent said inlet of said housing and which are adjustable to vary the amount of pressurized cold air that can enter said housing through said inlet and pass to and through said outlet and thence to said inlet to said room, said adjustable air-controlling means having a maximum air-flow position and a minimum air-flow position and an intermediate air-flow position, an air-moving device which is selectively operable to selectively draw air from said second source of air and selectively cause said air to pass through said outlet of said housing and thence to said inlet to said room, and a heat source which can selectively supply different amounts of heat to said air which said air-moving device draws from said second source of air and selectively causes to pass to and through said outlet of said housing and thence to said inlet to said room, said air-moving device being operable at different speeds and thereby being adapted to adjust the volume of air that said air-moving device can move and thereby being adapted to adjust the volume of air that said air-moving device can draw from said second source of air and cause to pass to and through said outlet of said housing and thence to said inlet to said room, said adjustable air-controlling means being adapted to respond to a temperature-sensing means which responds to a temperature that is related to the temperature of the air within said room to cause said adjustable air-controlling means to assume said maximum air-flow position and thereby permit a maximum amount of pressurized cold air to enter said housing through said inlet and pass to and through said outlet and thence to said inlet to said room and thereby affect the temperature of the air in said room, said adjustable air-controlling means also being adapted to respond to said temperature-sensing means to cause said adjustable air-controlling means to assume said minimum air-flow position and thereby permit a minimum amount of pressurized cold air to enter said housing through said inlet and pass to and through said outlet and thence to said inlet to said room and thereby affect the temperature of the air in said room, said adjustable air-controlling means additionally being adapted to respond to said temperature-sensing means to cause said adjustable air-controlling means to assume said intermediate air-flow position and thereby permit a less-than-maximum amount of pressurized cold air to enter said housing through said inlet and pass to and through said outlet and thence to said inlet to said room, and thereby affect the temperature of the air in said room, said air-moving device being adapted to respond to said temperature-sensing means to operate at different speeds to adjust the volume of air that said air-moving device can move and can thereby draw from said second source of air and cause to pass to and through said outlet of said housing and thence to said inlet to said room and thereby affect the temperature of the air in said room, said temperature-sensing means acting to cause said air-moving device to be inactive whenever said adjustable air-controlling means is in said maximum air-flow position, said heat source being adapted to respond to said temperature-sensing means to selectively supply different amounts of heat to said air which said air-moving device draws from said second source of air and causes to pass to and through said outlet of said housing and thence to said inlet to said room and thereby affect the temperature of the air in said room, said heat source and said air-moving device and said adjustable air-controlling means acting, whenever said temperature is above a predetermined level, to cause no heat to be supplied by said heat source and to cause said air-moving device to be inactive and thereby draw no air from said second source of air and also to cause said adjustable air-controlling means to assume said maximum air-flow position and thereby permit the amount of pressurized cold air which can enter said housing through said inlet to be a maximum, said heat source and said air moving device and

said adjustable air-controlling means acting, whenever said temperature is between said predetermined level and a second level which is below said predetermined level, to cause no heat to be supplied by said heat source and to cause said air-moving device to be inactive and thereby draw no air from said second source of air and also to cause said adjustable air-controlling means to assume said intermediate air-flow position and thereby permit the amount of pressurized cold air which can enter said housing through said inlet to be less than maximum, said heat source and said air-moving device and said adjustable air-controlling means acting, whenever said temperature is between said second level and a third level which is below said second level, to cause no heat to be supplied by said heat source and to cause said air-moving device to operate at low speed and thereby draw limited amounts of air from said second source of air and cause said air to pass to and through said outlet of said housing and thence to said inlet to said room and also to cause said adjustable air-controlling means to be in said minimum air-flow position and thereby minimize any flow of pressurized cold air into said housing through said inlet, said heat source and said air-moving device and said adjustable air-controlling means acting, whenever said temperature is between said third level and a fourth level which is below said third level, to cause no heat to be supplied by said heat source and to cause said air-moving device to operate at high speed to draw larger amounts of air from said second source of air and cause said air to pass to and through said outlet of said housing and thence to said inlet to said room and also to cause said adjustable air-controlling means to be in said minimum air-flow position and thereby minimize any flow of pressurized cold air into said housing through said inlet, and said heat source and said air-moving device and said adjustable air-controlling means acting, whenever said first said temperature is between said fourth level and a fifth level which is below said fourth level, to cause appeciable amounts of heat to be supplied by said heat source and to cause said air-moving device to operate at high speed to draw said larger amounts of air from said second source of air and cause said air to be heated by said heat source and then pass to and through said outlet of said housing and thence to said inlet to said room and also to cause said adjustable air-controlling means to be in said minimum air-flow position and thereby minimize any flow of pressurized cold air into said housing through said inlet.

4,328,927

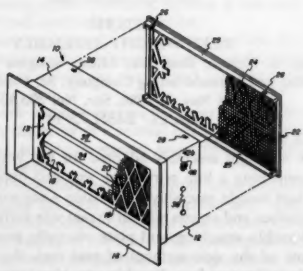
TEMPERATURE RESPONSIVE VENTILATOR CONSTRUCTION

Edward D. McSwain, Rte. 3, Box 203, Lincolnton, N.C. 28092

Continuation-in-part of Ser. No. 69,243, Aug. 23, 1979, Pat. No. 4,243,175. This application Nov. 20, 1980, Ser. No. 208,530

Int. Cl.³ F24F *13/08*

U.S. Cl. 236—49 **5 Claims**



1. A temperature-responsive ventilator construction comprising a housing defining an air flow passageway therethrough, a plurality of louvers mounted in said housing passageway and operatively interconnected for simultaneous pivotal movement in said passageway to control the flow of air therethrough, a temperature-responsive bimetallic coil spring located in said passageway, one end of said spring attached to an end portion of one of said louvers and the other end supportably received within a wall opening of said housing and engageable with said wall to pivotally support said end portion of said one louver and to move said louvers in response to temperature changes, and wherein said housing wall opening has a notched peripheral configuration to selectively receive said other end of the spring in one of a number of arcuately spaced positions therein and to prevent its rotation in the opening during expansion and contraction of the spring.

4,328,928

DEVICE FOR HOLDING A TUBULAR SUPPORT SPOOLING TEXTILE MATERIALS

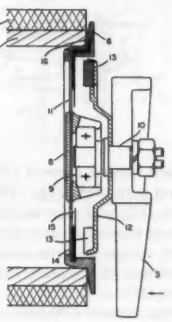
Robert Zang, Roanne, France, assignor to ASA S.A., Roanne, France

Filed Jul. 7, 1980, Ser. No. 166,324

Claims priority, application France, Jul. 10, 1979, 79 18407

Int. Cl.³ B65H *54/42, 49/26*

U.S. Cl. 242—18 DD **4 Claims**



1. A device for holding a tubular support on which yarn is spooled and which can be rotated by tangential contact with a drive cylinder, such device comprising in combination a pivotable yoke having first and second arms, respective first and second plates freely rotatably mounted on said arms to engage the tubular support, said first arm being laterally movable to allow positioning and removal of tubular supports, said first plate comprising a radially external part to centre and engage the tubular support, a radially internal part rotatably mounted on said first arm and a connecting element connecting said parts and allowing relative axial movement but not relative radial movement between said parts, and said device further comprising braking means operable to brake said first plate upon such relative axial movement between said parts.

4,328,929

YARN DELIVERY APPARATUS FOR USE WITH TEXTILE MACHINES

Gustav Memminger, Freudenstadt; Josef Fecker, Bisengen, and Wilfried Flister, Rottenburg, all of Fed. Rep. of Germany, assignors to Memminger GmbH, Freudenstadt, Fed. Rep. of Germany

Filed Sep. 4, 1980, Ser. No. 184,097

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936375

Int. Cl.³ B65H *51/20*

U.S. Cl. 242—47.01 **5 Claims**

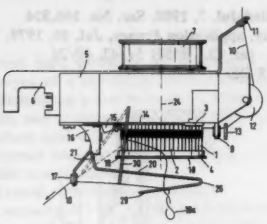
1. Yarn delivery apparatus for use in textile machines comprising

a storage drum (1) having a lower edge (18), on which at least one loop of yarn is wound to form a storage winding supply (14);

supply guiding means (9, 11, 12, 13) to guide yarn (10) to be supplied to a drum (1);

removal guiding means (17) to guide yarn being removed from the storage windings on the drum (1) and located laterally with respect to the axis of rotation (24) of the drum,

an intermediate yarn guide element (20) located between the lower edge (18) of the drum (1) and said yarn removal guide means (17), said intermediate guide element (20) being formed with at least one yarn guide edge (25) located adjacent the path of the yarn from the storage winding to the removal guide means (17) and laterally with respect to the axis of rotation (24) of the drum and an elongated narrow guide slot (23) extending from adjacent said guide edge toward the axis of rotation (24) of the drum;



a movable yarn sensing element (30) located in a position between said yarn guide edge (25) and the yarn removal guide means (17), said yarn sensing element being biased for movement toward the axis of rotation (24) of the drum upon absent tension of yarn passing thereover from the storage windings of the drum toward the yarn removal guide means (17);

a loop deflection element (29) positioned below the intermediate yarn guide element (20) attached to the intermediate yarn guide element (20) and comprising a re-entrant structure extending essentially parallel to and below the yarn guide element (20);

and including, in accordance with the invention,

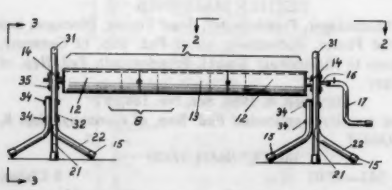
a longitudinal narrow slot (40) formed in the loop deflecting element (29) and merging into said elongated narrow guide slot (23) of the intermediate guide element (20).

4,328,930

COMPOSITE REEL AND STAND FOR A SWIMMING POOL COVER

Jiri Kalendovsky, 7482 Crannall Dr., Boulder, Colo. 80303

Filed Jul. 8, 1980, Ser. No. 166,983
Int. Cl.³ B65H *75/02*
U.S. Cl. 242—55 **10 Claims**



1. A reel and stand assembly for a swimming pool cover including:

(a) A composite reel comprising:

(1) a first hollow tubular member having open ends,

(2) a hub member secured in one of said open ends and having an axle shaft projecting therefrom,

(3) a second hollow tubular member having open ends,

(4) an expansible sleeve member positioned partially in each of adjacent open ends of the first and second hollow tubular members having their ends abutted and

(5) means accessible through the walls of said abutted ends to expand the expansible sleeve member and secure said first and second hollow tubular members together,

(b) a stand comprising:

(1) a U-shaped member having

(a) a bight portion connecting

(b) two parallel portions having their ends bent angularly with respect to the parallel portions to provide first and second legs for the stand and

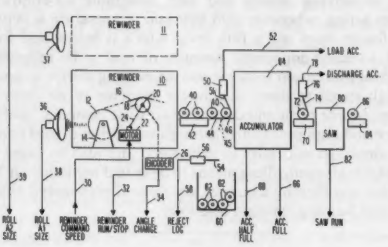
(2) a plate member spanning the space between the two parallel portions and having a bearing member adapted to receive and support said axle shaft.

4,328,931

AUTOMATIC SPEED CONTROL OF A REWINDER

Richard H.D. Bullock, Jr., Media, and H. William Fogle, Jr., Wallingford, Matthew R. Gordon-Clark, Swarthmore, all of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 128,506, Mar. 10, 1980, abandoned.
This application Feb. 27, 1981, Ser. No. 239,223
Int. Cl.³ B26D *7/06*; B65H *17/02*; B65G *17/16*
U.S. Cl. 242—67.5 **17 Claims**



1. An improved web finishing system comprising a web rewinder for making logs from a parent roll and an accumulator for temporarily storing logs, wherein the improvement comprises:

(a) first means for generating a signal representing the number of empty storage spaces in the accumulator, and

(b) circuit means responsive to the first means signal for automatically controlling the speed of the rewinder.

4,328,932

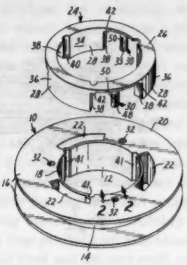
REEL WEIGHT ASSEMBLY

Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 3, 1980, Ser. No. 203,437
Int. Cl.³ B65H *75/18*
U.S. Cl. 242—71.8 **2 Claims**

1. In a weight assembly adapted for use with a polymeric reel comprising a hub portion an axis and opposite side surfaces, said weight assembly comprising a support plate having a side surface and an axis normal to said side surface, and means for releasably attaching said plate coaxially to said reel adjacent one of the side surfaces of said reel, the improvement wherein said means for releasably attaching comprises a plurality of attachment assemblies disposed around the axis of said plate, each of said attachment assemblies comprising a post having a first end fixed to said plate with said post projecting from said side surface of the plate and a pendulum having a free end portion adjacent said plate and being pivotably mounted

on the post adjacent the distal end of said post for movement in a radial direction with respect to the axis of said plate between



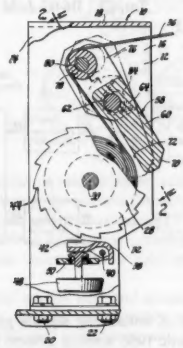
a release position generally aligned with the post, and a lock position with the free end portion projecting from the post.

4,328,933

BELT CLAMPING RETRACTOR

Richard D. Loose, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 26, 1980, Ser. No. 191,284
Int. Cl.³ A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.2 **1 Claim**



1. A seat belt retractor comprising:

a housing;

a reel rotatably mounted on the housing and having the belt wound thereon;

locking means actuable to lock the reel against belt unwinding rotation;

a lever having a belt clamping surface at one end thereof, another end, and a central portion;

pivot means mounting the lever central portion on the housing to permit radial clamping movement of the belt clamping surface toward the axis of reel rotation to clamp the belt on the reel;

spring means acting between the lever and the housing to establish the lever at a normal position in which the belt clamping surface is spaced away from the belt wound upon the reel;

a belt roller rotatably mounted on the other end of the lever and having the belt passing therearound whereby the imposition of occupant restraint load on the belt concomitant with lockup of the reel by the locking means forcibly pivots the lever so that the clamping surface frictionally engages the outermost winding of belt on the reel and compresses the underlying layers of wound-up belt against one another to prevent belt from spooling down and extending from the reel; and

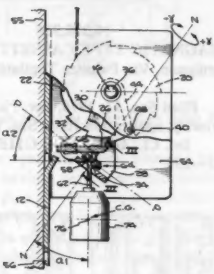
the relationship of the belt clamping surface relative the lever pivot means being such that the belt unwinding resultant force vector acting on the lever clamping surface tangentially of the outermost layer of belt wound upon the reel acts to impart a force moment acting about the lever pivot means in a direction to self-energize the lever in additive effort to the occupant restraint load acting on the belt roller.

4,328,934

SELF-ALIGNING INERTIA SENSOR ASSEMBLY

Munir J. Ahad, Valencia, Calif., assignor to American Safety Equipment Corp., San Fernando, Calif.

Filed Sep. 22, 1980, Ser. No. 189,727
Int. Cl.³ A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A **12 Claims**



1. In an inertia sensor assembly having a pendulum saddle with an annular pendulum hanging surface for vertically suspending a pendulum therebeneath, said pendulum having a weight body with a neck and head rigidly fixed to said neck, said head having a saddle contact surface for seating on said pendulum hanging surface to hang said weight body vertically therefrom, wherein movement of said weight body from its vertical position in response to changes in velocity rocks said saddle contact surface away from its seating engagement with said pendulum hanging surface to thereby actuate a pawl for locking a retractor reel when said weight body is moved beyond a predetermined distance from said vertical position, wherein forward or backward tilting of said pendulum saddle causes said saddle contact surface to rock relative said pendulum hanging surface as said weight body seeks a new vertical position below said tilted pendulum saddle, wherein the improvement in said inertia responsive assembly comprises:

inclining the pendulum hanging surface sideways; and

cocking the head on said neck to the same degree as said pendulum hanging surface is inclined so that said saddle contact surface seats on said pendulum hanging surface and said weight body is suspended vertically below whereby when said pendulum saddle is tilted forward or backward, said saddle contact surface seatingly rotates on said pendulum hanging surface to maintain said weight body vertically below said pendulum saddle without rocking said pendulum head.

4,328,935

FLEXIBLE MAGNETIC RECORDING TAPE HAVING LOW-FRICTION BACKSIDE COATING

Frank B. Steel, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 12, 1980, Ser. No. 158,694
Int. Cl.³ G11B *5/70*
U.S. Cl. 242—192 **13 Claims**

1. In a flexible magnetic recording tape having a magnetizable frontside coating and a nonmagnetizable backside coating, each coating comprising inorganic particles dispersed in a

nonmagnetizable polymeric binder, 0.5–10% by volume of said backside coating comprising nonmagnetizable particles of equant shape having an average diameter of at least 0.1 micrometer and a Mohs hardness of at least 7, and the tape having an overall thickness of 25 micrometers or less, the improvement comprising

said equant particles comprise substantially all of the particles in the backside coating which have an average diameter greater than 0.1 micrometer,

said equant particles have an average diameter of 0.1 to 0.5 micrometer,

not more than 10% of said equant particles have an average diameter exceeding about 0.8 micrometer,

substantially all of said equant particles are essentially free from sharp edges, and

the peak-to-peak surface roughness of the backside coating is 0.2–0.8 micrometer.

4,328,936

MAGNETIC TAPE CASSETTE GASKET

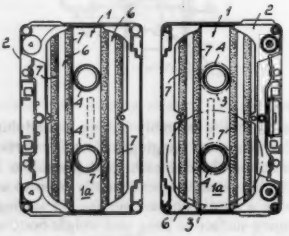
Abramo Bordignon, Via Palmiro Togliatti, 32, Senago, Milano, Italy

Filed Sep. 11, 1979, Ser. No. 74,411

Claims priority, application Italy, Sep. 15, 1978, 22779/78[U]

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—199 **2 Claims**



1. In a cassette for magnetic tape recording, having a casing with opposite walls, between which winding hubs for a tape winding are captured, a corrugated plastic film gasket located between the tape winding and the opposite walls respectively, wherein according to the improvement the corrugations of said plastic film have each a top portion in direct slidable engagement with the tape winding and wherein said top portions have a coating of lubricating substance thereon and wherein said corrugated plastic film has other surface portions distinct from said top portions and wherein said other distinct portions are without said coating of lubricating substance.

4,328,937

FISHING SPINNING REELS WITH AUXILIARY DRAG MECHANISMS

Joseph M. Holahan, Anderson, S.C.; Takehiro Kobayashi, and Konin Sazaki, both of Fukuyama, Japan, assignors to Ryobi Limited, Hiroshima, Japan

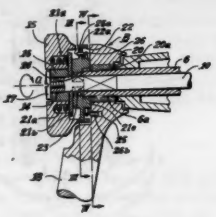
Filed Mar. 19, 1980, Ser. No. 131,673

Claims priority, application Japan, Jul. 5, 1979, 54-93299[U]; Jul. 6, 1979, 54-93698[U]; Jul. 6, 1979, 54-93699[U]; Jul. 9, 1979, 54-94883[U]

Int. Cl.³ A01K *89/02*

U.S. Cl. 242—218 **7 Claims**

1. In a fishing spinning reel comprising in combination a rotor, a handle, a main drag mechanism and a drag shaft, a boss of the handle connected through threads of a screw to a sleeve which supports the main drag mechanism, the drag shaft extending through the sleeve, and a drag knob connected to one end of said drag shaft, the improvement which comprises an auxiliary drag mechanism interposed between said drag knob and said handle boss, said auxiliary drag mechanism comprising an annular ring interposed between said drag knob and and said handle boss and a torque spring interposed between said annular ring and said handle boss so that when said handle is rotated about said sleeve said annular ring is moved in the



direction of said drag knob and said torque spring is compressed to increase its twisting torque so as to return said handle to its original position upon release.

4,328,938

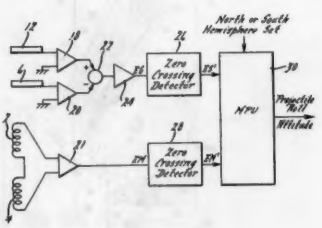
ROLL REFERENCE SENSOR

Elias Reisman, Orange; S. Kirby Wilson, Ramona; Paul G. M. McManigal, Newport Beach, and Lawrence L. Goldberg, Villa Park, all of Calif., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Jun. 18, 1979, Ser. No. 49,531

Int. Cl.³ B64G *1/36*

U.S. Cl. 244—3.1 **12 Claims**



12. A method of initializing signals generated by an earth generated magnetic field sensing system to provide an unambiguous indication of a vertical reference direction in a spinning body containing the said electromagnetic sensing system comprising the steps of:

sensing an earth generated electrostatic field on said spinning body;

generating an unambiguous sinusoidal signal indication of the strength and polarity of said electrostatic field;

comparing said signals generated by said electromagnetic field sensing system with said unambiguous sinusoidal signal and determining the phase angle between said compared signals; and

correcting said signals generated by said electromagnetic field sensing system by said phase angle to achieve an unambiguous indication of the vertical reference direction with respect to said spinning body.

4,328,939

AIRPLANE MAIN LANDING GEAR ASSEMBLY

John W. Davies, Renton, and Edward C. Wells, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 26, 1979, Ser. No. 107,154

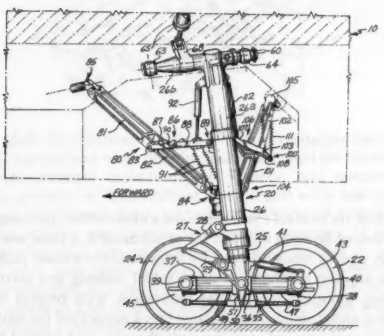
Int. Cl.³ B64C *25/04*

U.S. Cl. 244—102 R **8 Claims**

1. A main landing gear assembly for an airplane having a fuselage and a wing, comprising:

a shock strut having first and second ends and wheel means journalled to said second end of said shock strut, said first end of said shock strut being swingably attached to said wing of said airplane for swinging movement of said shock strut and wheel means about a pivot axis oriented generally parallel to the longitudinal axis of said fuselage, whereby said shock strut and wheel means are thereby swingable along a predetermined travel path between a downwardly depending, extended position for taxiing and landing of said airplane and a retracted position wherein said shock strut and said wheel means are swung inwardly and upwardly from said extended position and stowed with said wheel means in a wheel bay of said fuselage;

a foldable drag strut having first and second ends, said first end of said drag strut being pivotably attached to said shock strut at a first position on said shock strut intermediate between said first and second ends of said shock strut, said second end of said drag strut being pivotably attached



to a first fixed point of said airplane, said first fixed point of said airplane being inward and forward of said first end of said shock strut, and first releasable locking means for maintaining said drag strut in a non-folded, aligned configuration with said shock strut in said extended position; and,

a foldable side strut having first and second ends, said first end of said side strut being pivotably connected to said shock strut at a second position on said shock strut intermediate between said first and second ends of said shock strut, said second end of said side strut being pivotably connected to a second fixed point of said airplane, said second fixed point of said airplane being inward and rearward of said first end of said shock strut, and second releasable locking means for maintaining said side strut in an unfolded, aligned configuration when said shock strut is in said extended position, said drag strut and said side strut operating to bear a portion of drag and weight loads imposed on said landing gear assembly.

4,328,940

METHOD OF ELECTROSTATICALLY ENHANCING DEPOSITION OF AIR BORNE SPRAY MATERIALS

David H. Malcolm, West Paterson, N.J., assignor to Electrogasdynamics, Inc., East Hanover, N.J.

Continuation of Ser. No. 315,075, Dec. 14, 1972, abandoned. This application Aug. 9, 1978, Ser. No. 932,317

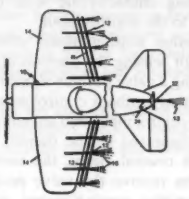
Int. Cl.³ B64D *1/18*

U.S. Cl. 244—136 **3 Claims**

1. In the spraying of particulate material to ground from an airplane flying in close proximity thereto, the steps of

imposing an electrical charge of given polarity upon a primary spray of particulate material continuously emitted from the underside of said airplane and at a location well forward of the tail section thereof, said charge being of sufficient magnitude to electrostatically enhance the deposition of said emitted primary spray particles, and

concurrently physically and continuously emitting a secondary spray of oppositely charged particulate material in the form of a rearwardly directed jet from the tail section of said airplane at a location disposed well above the locus of emission of said primary spray and at a current level of a magnitude to avoid material degradation of the charge on said primary spray intermediate its loci of emission and deposition and at a charge to mass ratio of at least three



times greater than the charge to mass ratio for said primary spray

said secondary spray particles being from 0.1 to 50 microns in diameter and having, under ambient conditions, a mobility no greater than 10^{-5} meters per second per volt per meter and a useful life of at least one second after emission so that at least the major portion of the charged primary spray particles will be deposited without neutralization of the charge thereon by interaction with said secondary spray particles.

4,328,941

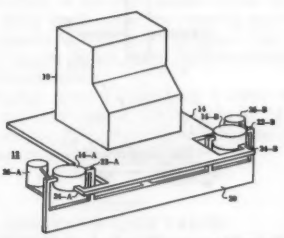
SHOCK AND VIBRATION ISOLATION SYSTEM

Edward H. Phillips, Middletown, and Lawrence A. Wise, Sunnyvale, both of Calif., assignors to Optimetrix Corporation, Mountain View, Calif.

Filed Oct. 11, 1979, Ser. No. 83,770

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—550 **8 Claims**



1. A vibration isolator system for supporting a mass, comprising:

first feedback control loop means comprising:

gas-filled support means having a gas accumulator means and being coupled to the mass for applying a supporting force to the mass and for changing the supporting force applied to the mass in response to changes in the pressure of a gas in the gas accumulator means;

valve means connected to the gas accumulator means for admitting pressurized gas to and exhausting gas from the gas accumulator means;

mass position sensing means for sensing the position of the mass and for producing a signal indicative of the position of the mass; and

mass position feedback control means having an input and

an output, the input being connected to receive the signal from the mass position sensing means; and

second feedback control loop means coupled to the valve means and the output of the mass position feedback control means, the second feedback control loop means comprising:

valve actuating means having a control input and being connected to the valve means for controlling the position of the valve means in response to a signal applied to the control input, the valve actuating means having an integrating characteristic with respect to the signal applied to the control input;

valve position sensing means connected to the valve means for sensing the position of the valve means and producing a valve position signal indicative thereof; and

valve position feedback control means having a reference input, a control input, and an output, the reference input being connected to the output of the mass position feedback control means, the control input being connected to receive the valve position signal from the valve position sensing means, and the output being connected to the control input of the valve actuating means;

wherein the second feedback control loop means is a position feedback control loop having a bandwidth greater than the bandwidth of the first feedback control loop means.

4,328,942

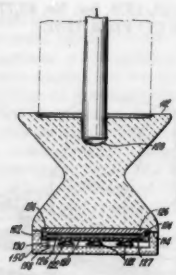
DISPLAY PEDESTAL

Betty Birnbaum, 11 Fifth Ave., New York, N.Y. 10003

Filed Apr. 23, 1979, Ser. No. 32,232

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—558 **4 Claims**



1. A pedestal comprising a body comprising opposite faces, each of predetermined area and lying in a plane which is substantially parallel with the plane of the other face, the body narrowing after the fashion of an hourglass from the predetermined area of each face to a central waist portion of minimum cross sectional area in a plane taken parallel to the said planes of the opposite faces, one of said faces being of sizeable area and adapted to be disposed either lowermost to afford stability or uppermost to serve as a candle holder by means of a candle receiving orifice in said one of said faces, and a plurality of suction cups secured to and protruding from the other of said faces, whereby when said pedestal is used as a support for another object the said other of said faces may be disposed uppermost to afford vacuum grip with the object supported by said pedestal and whereby when said pedestal is used as a candle holder the said other of said faces may be disposed lowermost to grip the supporting surface.

4,328,943

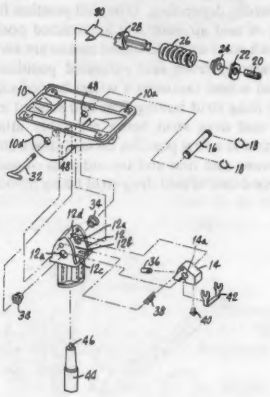
CONTROL MECHANISM FOR A CHAIR OR THE LIKE

James B. Eldon, III, Barto, Pa., assignor to Knoll International, Inc., New York, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,118

Int. Cl.³ A45D *19/04*; A47C *3/026*

U.S. Cl. 248—578 **7 Claims**



1. A tilt control mechanism for a chair or the like comprising a control housing adapted for attachment to a chair seat or the like, a pivot block adapted for attachment to a chair pedestal or like support mechanism, said control housing and pivot block being mounted for pivotal movement with respect to each other about an axis, an actuator block supported for movement along said axis and carrying a pin thereon, said control housing including a flange which engages said pin in a predetermined location of said actuator block along said axis preventing said pivotal movement of said control housing with respect to pivot block, and in another position of said actuator block along said axis, said pin and flange are out of engagement, permitting said pivotal movement of said control housing with respect to said pivot block.

4,328,944

LOAD SUPPORTING DEVICE

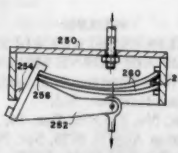
Jakhin B. Popper, Kiryat Motzkin, Israel, assignor to Popper Engineering Ltd., Motzkin, Israel

Filed May 21, 1979, Ser. No. 41,189

Claims priority, application Israel, May 23, 1978, 54767; Jan. 4, 1979, 56372

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—593 **9 Claims**



1. A deflecting load supporting apparatus comprising:

a base;

a load receiving lever element pivotably mounted onto said base;

at least one buckling element disposed in engagement with said base and said load receiving lever element so as to

undergo a predetermined buckling displacement under at least a predetermined load; and

an intermediate lever member pivotably mounted on said lever element for interconnecting said lever element and said at least one spring.

4,328,945

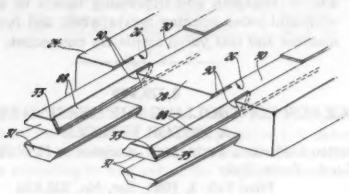
BATTERY CONTAINER MOLD

William J. Perkins, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 172,759, Jul. 28, 1980, abandoned. This application Jun. 10, 1981, Ser. No. 272,110

Int. Cl.³ B29C *1/06, 7/00;* **B29F** *1/022, 1/14*

U.S. Cl. 249—67 **5 Claims**



1. A mold for injection molding a battery container having bottom, side and end walls defining a compartment for housing the electrochemical innards of said battery, said container having a plurality of thin, resilient ribs integral with, and projecting at acute angles from, said end walls into said compartment for holding said innards substantially centrally of said compartment, said ribs each having a base portion at said bottom wall, said mold including female and core-bearing portions coacting in a mold-closed position to define a mold cavity corresponding to said container, said core-bearing portion including a mandrel having an exterior surface for shaping the internal surface of said compartment and means for stripping said container from said mandrel, said stripping means including:

dovetail-like mortises in said mandrel, each mortise being defined in part by opposing side walls diverging from said surface of said mandrel at substantially said acute angle;

substantially complementary-shaped ejector bars reciprocally slidable within said mortises, said ejector bars each being defined in part by opposing faces juxtaposed said mortise side walls and being adapted for movement between an extended container-release position and a retracted container-molding position;

a recess in each of said faces defining a rib-forming cavity between said ejector bar and an associated mortise side wall while said ejector bar is in said retracted position;

means joined to a first end of each of said ejector bars for moving said ejector bars between said retracted and extended positions such that said ejector bars travel with said ribs to free said ribs from said rib-forming cavity at the time said container is stripped from said mandrel; and

a lip on the distal end of each of said ejector bars opposite said first end, said lip projecting from a said face toward the associated juxtaposed mortise side wall to provide an undercut in said base portion of each of said ribs.

4,328,946

FLOW CONTROL DEVICE

Marius J. Morin, Rancho Palos Verdes, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Division of Ser. No. 957,778, Nov. 6, 1978, Pat. No. 4,265,425. This application Feb. 17, 1981, Ser. No. 235,359

Int. Cl.³ F16L *55/14*

U.S. Cl. 251—9 **5 Claims**

1. A flow control device comprising:

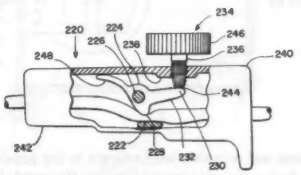
a body member with a passage for receiving a single length of flexible tubing, which is adapted to be gripped by hand, and which provides a clamping surface for the tubing and having a clamping member associated with the body member for urging the tubing against the clamping surface,

the clamping member having a pivotal attachment portion attached to the body member and having a tubing-engaging surface,

the tubing-engaging surface and the clamping surface having configurations such that rotational movement of the clamping member in one direction causes the tubing to be progressively compressed by a first extension extending from said pivotal attachment portion,

the clamping member further having a second extension extending from said pivotal attachment portion and having means for coacting with a force-inducing member mounted on the body member and adapted for rotational movement,

the distance between the coacting means and the pivotal attachment of the clamping member being at least twice the distance between the pivotal attachment and the tubing-engaging surface, the force-inducing member having means for activating the coacting means of the clamping member,



the outer end of the second extension bearing the tubing-engaging surface and the outer end of the first extension bearing the coacting means for the clamping member to be actuated by the force-inducing member;

and

a third extension integrally formed on the clamping member projecting generally in a direction away from the first and second extensions, the third extension comprising a spring-like member the outer end of which is adapted to contact a portion of the body member when the screw member is being urged against the coacting means of the clamping member, said contact providing a bias to urge the tubing engaging surface of the clamping member away from said flexible tubing,

the force-inducing member comprising a screw member having an outer end adapted to be grasped by the fingers of an operator and an inner end for actuating the coacting means of the clamping member.

4,328,947

PENDULUM GATE VALVE

Uwe Reimpell; Lutz Grein, both of Hanau am Main; Reinhard Reiter, Gelnhausen, and Friedrich Stark, Langenselbold, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 820,957, Aug. 1, 1977, abandoned. This application May 21, 1979, Ser. No. 41,214

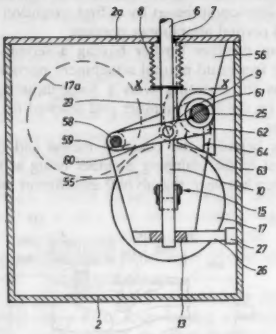
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634885

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—80 **12 Claims**

1. Pendulum gate valve with a pressure-tight housing and inlet and outlet openings arranged on opposite sides of said housing, with at least one seal bearing surface, a unitary pendulum frame pivotable transverse to the axis of the inlet and outlet openings about a single pivot axis which is stationary relative to the housing, stop means for limiting the pivoting movement of the pendulum frame, at least one gate valve plate

mounted opposite the pendulum frame for movement parallel to the axis of the inlet and outlet openings, a drive rod passing in a pressure tight and essentially linear manner through the housing, a pressure device in the pendulum frame mounted for longitudinal movement with respect to the pendulum frame when actuated for urging the gate valve plate against the seal bearing surface and means pivotally joining the drive rod to the pendulum frame and the pressing device about a pivot joint which is movable with the pendulum frame about the station-



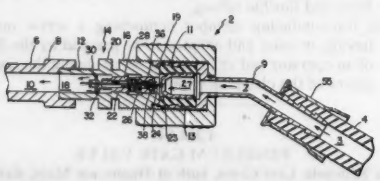
ary axis and movable with respect to the pendulum frame such that during the closure movement, the pendulum frame is first pivoted with the pivot joint moving therewith to align the gate valve plate with the seal bearing surface, and then the pivot joint moves with respect to the pendulum frame to actuate the pressing device and wherein the movement of the pendulum frame and thereafter the pressing device guides the drive rod and the joint in an essentially linear direction throughout the total path by the joint.

4,328,948

FLUID LINE COUPLING WITH SELF-ADJUSTING VALVE DEPRESSOR FOR REFRIGERATION REFRIGERANT TESTING AND CHARGING HOSES

David S. Pearl, II, Fort Lauderdale, Fla., assignor to Uniweld Products, Incorporated, Fort Lauderdale, Fla.

Filed Feb. 25, 1980, Ser. No. 123,952
Int. Cl.³ F16L *37/10, 37/28*
U.S. Cl. 251—149.6 **9 Claims**



1. In a coupling for joining the end of a first fluid line member to the end of a second fluid line member,

said second fluid line member including at its end portion a valve nipple, a valve positioned in said valve nipple, said valve including inwardly movable means for opening it to the flow of fluid therethrough and through said second fluid line member and also including means for yieldably resisting the inward movement of said opening means into said nipple,

tubular coupling means at the end portion of said first fluid line member for connecting said first fluid line member and said valve nipple of said second fluid line member,

an axially self-adjusting valve opening element including a body portion having a passageway therethrough and axially extending spline members on its outer surface and means for engaging and depressing said valve opening means inwardly into said nipple against said valve means for yieldably resisting the inward movement of said valve opening means when said first fluid line member and said valve nipple are connected,

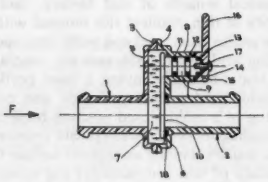
resilient material tubular sleeve means mounted concentrically within said tubular coupling means both for forming an annular seal against the end portion of said valve nipple and for retaining said axially self-adjusting valve opening element in position, said axially extending spline members on the outer surface of said valve opening element body portion extending into and in engagement with the resilient material tubular sleeve means, while allowing axial adjustment of said self-adjusting valve opening element and its engaging and depressing means in engagement with said valve opening means when said first fluid line member and said valve nipple are connected.

4,328,949

COCK FOR CONTROLLING THE HEATING SYSTEM OF A MOTOR VEHICLE

Maurico Oddenino, Turin, Italy, assignor to ITW Fastex Italia S.p.A., Turin, Italy

Filed Feb. 2, 1981, Ser. No. 230,836
Claims priority, application Italy, Feb. 8, 1980, 20743/80[U]
Int. Cl.³ F16K *1/20*
U.S. Cl. 251—165 **1 Claim**



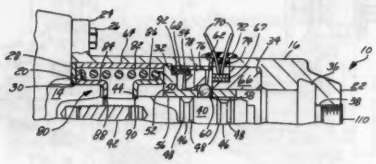
1. A cock for controlling the heating system of a motor vehicle of the type including a housing having a chamber, upstream and downstream pipe fittings each communicating with port means in said chamber walls, said pipe fittings being disposed in co-axial spaced opposition, seat means in said chamber interior wall surrounding said downstream port means, and a flat valve member controlled by a lever and adapted to be moved laterally into and out of covering engagement with said seat means, said housing including an integral through bored sleeve positioned laterally of said port means, said sleeve having a predetermined length with its interior communicating with said chamber at one end and ambient at the other end, integral pin means connected to said valve member at one end and extending into said sleeve, said pin having means at its opposite end for accepting an adjustment screw associated with said lever, said lever including a cup shaped portion at one end having a polygonal shaped bore of a predetermined depth and said cup shaped portion including a free edge, said pin including at its free end opposite its connection to said valve a complementary shaped polygonal end acceptable in said polygonal shaped bore, said pin having a length from said valve to its free end less than the combined length of said predetermined length sleeve and said predetermined depth polygonal bore, whereby when the free edge of said cup shaped portion bears on the ambient end of said bore sleeve said adjustable screw can be inserted through the cup shaped portion into the screw accepting means of said pin and pull the valve member into biased relation with said seat means, whereby under operating conditions said valve member is permanently biased by multiple means in the form of upstream pressure acting in said chamber on said flat valve member and said adjustable screw means capable of biasing said valve member against a sealing ring provided in the seat means.

4,328,950

MAGNETIC DETENT FOR A CONTROL VALVE

Ronald A. Aspinwall, Detroit, Mich., assignor to Sperry Corporation, Troy, Mich.

Continuation of Ser. No. 93,781, Nov. 13, 1979, abandoned. This application May 6, 1981, Ser. No. 260,965
Int. Cl.³ F16K 35/04
U.S. Cl. 251—297 11 Claims



1. A magnetic detent for a control valve, said valve having a sliding spool movable from a neutral position to a detented position, said magnetic detent being housed within an end cap adapted for mounting to said valve, the magnetic detent comprising:

a. a magnet member mounted in said end cap;

b. a spool extension having spaced annular detent grooves formed in the periphery thereof and adapted for attachment to and movement with said sliding spool;

c. a centering spring mounted in said end cap in engagement with said spool extension and biasing said spool extension to said neutral position;

d. a clapper member movably mounted in said end cap;

e. a plurality of axially aligned balls interposed between said clapper member and the periphery of the spool extension, said balls spacing said clapper member from said magnet member when said spool extension is in said neutral position;

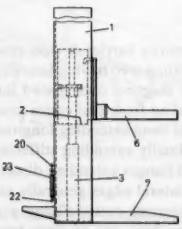
f. a spring member having a stationary end bearing against a member fixed in said end cap and a movable end bearing against said clapper member and urging said clapper member in the direction of said magnet member and, in turn, urging said balls against the periphery of the spool extension such that upon movement of the spool extension in either direction from said neutral position said spring member expands to drive said clapper member toward said magnet so that the balls move radially into one of said detent grooves and said clapper member thereafter is moved into contact with the magnet member.

4,328,951

HYDRAULIC LIFTING DEVICE

Anton Laupper, Im Malarsch 4, 9494 Schaan Fürstentum, Liechtenstein

Filed Apr. 7, 1980, Ser. No. 138,118
Claims priority, application Austria, Apr. 13, 1979, 2817/79
Int. Cl.³ B66F 3/00
U.S. Cl. 254—89 H 9 Claims



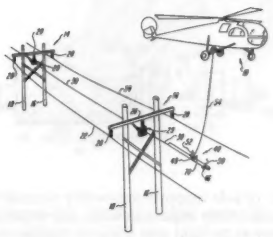
1. A hydraulic lifting mechanism particularly of the type useful as a lifting jack having a safety locking device comprising a toothed rack, a locking pawl adapted to engage said rack, an actuating lever engaging said locking pawl, a rail extending at least approximately in a vertical direction, said actuating lever having a free end which is movably guided in said rail, said rail being adjustably movable at least in directions transversely to its longitudinal extensions, and a roller and an angular sliding member mounted at a free end of said actuating lever rotatable relative thereto about a horizontal axis, said sliding member including a flange extending generally parallel to said horizonal axis with said roller and said flange defining therebetween a slot within which said rail is engaged.

4,328,952

APPARATUS AND METHODS FOR LINE STRINGING

Claude L. Chapman, 3300 W. Union, Englewood, Colo. 80110

Filed Dec. 13, 1979, Ser. No. 103,348
Int. Cl.³ B66D 1/36
U.S. Cl. 254—134.3 R 13 Claims



1. Stringing apparatus for a line comprising:

support means;

fastening means for attaching a hoist line carried by an aircraft to said support means;

first and second hoist line fasteners spaced from one another on said support means for releasably connecting said support means to the lower end of said hoist line;

first and second tower catches on said support means for releasably engaging portions of a tower to catch hold of and secure said support means to the tower after said hoist line is released from said support means, said first hoist line fastener being in front of said first tower catch and said second hoist line fastener being in front of said second tower catch whereby the hoist line is first secured to said second hoist line fastener and said support means is first secured to the tower by said first catch and advanced relative to the tower by releasing said hoist line from said second hoist line fastener, flying to a position for engaging said first hoist line fastener to move said second tower catch into engagement with said tower and reattach said hoist line to said second hoist line fastener; and

threading means operatively associated with said support means to pass an end of a line through a line-holding structure supported by an upper cross support on a tower with no side access while suspended from the aircraft.

4,328,953

PORTABLE CYLINDER WITH MULTI-USE REMOVABLE ATTACHMENTS

Thomas D. McBride, Washington Township, Bergen County, N.J., assignor to Joan McBride, Westwood, N.J.

Filed Apr. 21, 1980, Ser. No. 142,470
Int. Cl.³ B65H 59/00
U.S. Cl. 254—134.3 R 5 Claims

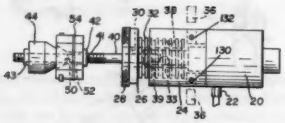
1. A portable hydraulic cylinder operable by use of a hand held pump apparatus or a small motor, said cylinder including a piston and rod which is moved by pressurized fluid to an inner and outer limit with selective input and output of pressur-

ized fluid, said cylinder having its outer body contoured so as to removably retain in a fixed attitude and position an attachment apparatus that utilizes forces developed by the movement of said piston rod, the removable attachment apparatus to the body of the cylinder including:

(a) at least one pressurized fluid conductor operably connected to one end of the cylinder when and while the removable attachment apparatus is mounted to the cylinder body and is used therewith, said conductor carrying the pressurized fluid to and from the cylinder;

(b) means for securing said removable attachment apparatus to said cylinder body, and when and while secured in a fixed relationship to said cylinder body the attachment apparatus does not interfere with the actuation of the piston and rod, said attachment apparatus having an aperture therethrough so that said removable attachment apparatus is disposed to enclose said rod;

(c) means for removably attaching a pull rod and an attached expander wedge to the extending end of the piston rod, said pull rod and attached expander wedge moved towards and away from the cylinder by the movement of the piston;



(d) a pair of side supports removably secured to said removable attachment apparatus when and while secured to said cylinder body, said side supports disposed to lie adjacent to said removable attachment apparatus with the distal ends of the side supports retaining an axle on which there is mounted a freely rotatable pulley grooved to receive tubing, cable, rope and the like, and in said removable attachment apparatus there is provided adjustable receiving means;

(e) a stop shoulder means carried by the adjustable receiving means in the removable attachment apparatus, this stop shoulder disposed to permit the pull rod to be freely movable therein and therethrough; and

(f) an expander segment grouping disposed to be expanded when moved against said stop shoulder, the expander grouping exteriorally sized to be inserted into a hole of determined size and with the continued movement of the expander wedge towards the cylinder to provide expansion of the expanding segments, said expanded segments becoming securely mounted in the selected hole and after the expander grouping is expanded the side supports carrying the rotatable pulley are secured and available for pulling and bending cable, tubing, rope and the like and also are available as a pulley for lifting.

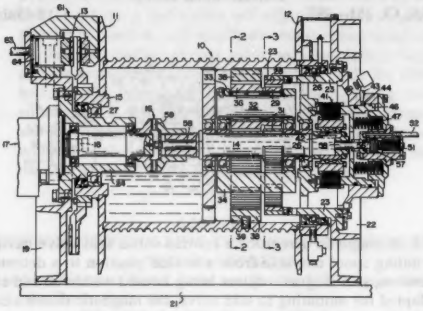
4,328,954

WINCH WITH COMPACT, HIGH EFFICIENCY AND HIGH RATIO GEARING SUITABLE FOR FREE FALL

Anthony T. Logus, Elmwood Park, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Filed May 7, 1979, Ser. No. 36,865
Int. Cl.³ B66D *1/08, 1/22*
U.S. Cl. 254—344 **6 Claims**

4. A winch including a drum for a hoist line; a drive shaft concentric with the drum; a sun gear locked to the drive shaft; single-stage high ratio and high efficiency compound planetary gearing within the drum, driven by the sun gear and driving the drum; said gearing including a fixed internal gear, an internal gear on the drum, and two coaxial planetary pinions locked together and orbiting together but of different pitch diameters, and having exactly three points of meshing with gears of said gearing, one point being meshing of one pinion with the fixed internal gear, another point being meshing of the other pinion with the internal gear on the drum, and the third point being meshing of one of the pinions with the sun gear; a fail-safe brake spring-biased for engagement and acting to prevent rotation of the drive shaft and through the drive shaft and



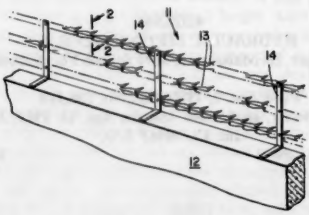
gearing to prevent rotation of the drum in a load lowering direction; and means actuated by fluid subject to manual control for fully releasing said brake whereby it offers no resistance to load lowering while the gearing remains in mesh and fully operative between the drum and the drive shaft.

4,328,955

DEFENSIVE PERSONNEL BARRIER

Albert L. Hermans, 2251 Bancroft Ave., San Leandro, Calif. 94577

Filed Mar. 10, 1980, Ser. No. 129,274
Int. Cl.³ B21F *25/00;* **E04H** *17/04*
U.S. Cl. 256—8 **8 Claims**



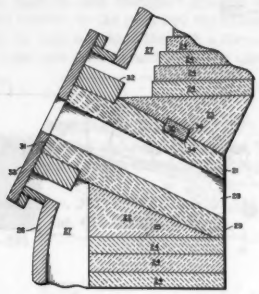
1. A defensive security barrier device, comprising a narrow, longitudinally extending web having laterally opposed edges, a plurality of parallel diagonal cuts spaced longitudinally along said web and extending from said edges toward the centerline of said web, a medial bend extending longitudinally in said web to define a longitudinally extending stiffening spine and a pair of laterally opposed flanges extending directly therefrom at an oblique angle, said lateral edges generally extending in a common plane, said diagonal cuts defining a plurality of acute angle portions being bent out of their respective flanges to form a plurality of barbs, said barbs extending outwardly from said common plane in the same general direction.

4,328,956

TAPHOLE ASSEMBLY AND METHOD OF INSTALLATION

Samuel J. LaLama, Poland, and Paul T. Fennema, Salem, both of Ohio, assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 24, 1980, Ser. No. 219,623
Int. Cl.³ C21B 7/06, 9/06
U.S. Cl. 266—275 6 Claims



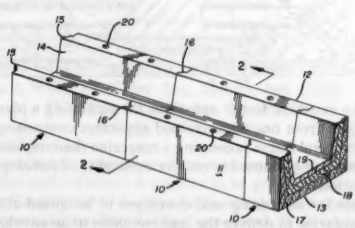
1. Taphole assembly adapted for use in a furnace, said assembly comprising: (1) a monolithic central block having an upper face, a lower face, two opposing side faces, an inner end face and an outer end face, the two side faces converging toward the inner end face, said block having a passageway adapted to carry flowing molten metal and extending from the inner end face to the outer end face; (2) a bottom wedge block having a lower face, an upper face, an outer face, and two opposed side faces; and (3) a top wedge block having a lower face, an upper face, an inner face, and two opposed side faces; the configuration of both upper and lower wedge blocks being such that, when assembled with the upper face of the bottom block against the bottom face of the central block, and the lower face of the top block against the upper face of the central block, the lower face of the bottom wedge block is parallel to the upper face of the top wedge block, the side faces of each wedge block lying within the planes formed by extension of the side faces of the central block; the top and central blocks being keyed together to prevent relative movement parallel to their contacting faces.

4,328,957

PREFABRICATED MULTIPLE DENSITY BLAST FURNACE RUNNER

Michael D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 123,369, Feb. 21, 1980, Pat. No. 4,262,885. This application Nov. 12, 1980, Ser. No. 206,287
Int. Cl.³ C21B 7/14
U.S. Cl. 266—196 6 Claims



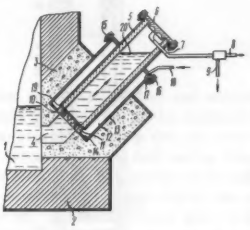
1. A hot metal runner unit comprising an elongated trough-like body member having a base and spaced parallel upstanding side sections wherein said runner unit is a multi-layered mass coalesced by physical force not under thermal influence with each of multi-layers being of a different density and having a known predetermined lifetime when subjected to molten metal flowing therethrough.

4,328,958

APPARATUS FOR STIRRING MOLTEN METAL IN CONTAINER

Boris S. Dolzhenkov, ulitsa Aerodromnaya, 87, kv. 2, Kuibyshev, U.S.S.R.

PCT No. PCT/SU79/00025, § 371 Date Apr. 7, 1980, § 102(e) Date Apr. 7, 1980, PCT Pub. No. WO80/00364, PCT Pub. Date Mar. 6, 1980
PCT Filed May 15, 1979, Ser. No. 195,199
Claims priority, application U.S.S.R., Aug. 7, 1978, 265440
Int. Cl.³ C21C 7/00; C22B 9/00
U.S. Cl. 266—233 4 Claims



1. An apparatus for stirring molten metal in a container, comprising a refractory-lined pipe with a removable cover fitted with an opening provided to communicate the interior of the pipe with a compressed gas supply means and with a vacuum system, characterized in that the pipe (5) is arranged in a stepped conduit (4) of a tubular structure (3) formed of refractory material, and wherein positioned bellow the lower end of the pipe (5) and coaxially therewith on a stepped projection (10) of the wall of the conduit (4) formed in the structure (3) is a sleeve (II) from a porous material, the external side surface of said sleeve and the wall of the conduit (4) of the structure (3) forming an annular space (12) confined from below by the projection (10) and from above by an annular cover (16) with an opening (17) for communicating the annular space (12) with a refining gas supply system (18).

4,328,959

METHOD AND DEVICE FOR REMOVING USED REFRACTORY LINING AND/OR SLAG DEPOSITS FROM ELONGATED VESSELS

Gerwin Holmann, Fürst-Bismarck-Str. 9, 4100 Duisburg 13, Fed. Rep. of Germany

Filed Nov. 14, 1980, Ser. No. 208,054
Int. Cl.³ F27D 23/02
U.S. Cl. 266—281 7 Claims

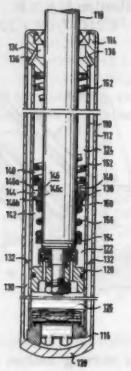
1. A method of removing used refactory lining from the inner wall of an elongated vessel, particularly pig-iron cars and mixers, using an apparatus of the type having cutting means operable to cut one or more recesses in the refractory lining, guide means for longitudinally guiding said cutting means centrally along the interior of the vessel and expander means connected to the guide means operable to contact one of the refractory lining and wall and fixably locate the guide means in the vessel, comprising the steps of locating the guide means within the vessel, operating the expander means to fixedly locate the guide means, actuating the cutting means to cut one or more recesses in the refractory lining extending from the surface of the lining to the wall of the vessel, and further comprising continuously rotating the vessel in one direction.

4,328,960

FLUID DAMPING UNIT FEATURING COMBINED FLUIDIC AND SPRING DAMPING CHARACTERISTICS

Gunther Handke, Euerbach; Robert Eusemann, Bergrheinfeld, and Felix Wössner, Schweinfurt, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 1, 1979, Ser. No. 8,513
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1978, 2806541
Int. Cl.³ F16F 13/00
U.S. Cl. 267—8 R 5 Claims



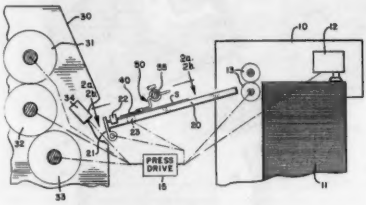
1. A fluidic damping unit particularly suitable for use as a shock absorber comprising: cylinder means; piston rod means operably interposed within said cylinder means for reciprocal movement between a pair of terminal positions representing, respectively, the fully extended and the fully retracted position of said piston rod means relative to said cylinder means; a guiding and sealing unit operatively mounting said piston rod means relative to one end of said cylinder means; piston means affixed to said piston rod means within said cylinder means dividing the interior of said cylinder means into a pair of fluidic working chambers, one of said working chambers being defined between said guiding and sealing unit and said piston means; and composite damping means dividing said one working chamber into a first partial chamber adjoining said guiding and sealing unit and a second partial chamber adjoining said piston means, said composite damping means operating to create a damping force applied against said piston rod means during a portion of its movement intermediate said pair of terminal positions; said composite damping means comprising throttling fluid passage means and additional fluid passage means extending between said first and said second partial chambers, a control sleeve, first spring means interposed for compression between said control sleeve and said guiding and sealing unit, second spring means interposed for compression between a fixed point on said piston rod means and said control sleeve, and a damping ring arranged in frictional sliding engagement with said cylinder means and received by said control sleeve to be axially movable with respect thereto between a pair of end positions, one of said end positions being proximate said piston means and the other end position being away from said piston means, said damping ring operating to close off said additional fluid passage means when in said one end position and to open said additional fluid passage means when in the other of said end positions.

4,328,961

HOLD-DOWN FOR USE ON FEED TABLE OF PRINTING PRESS

Erich Wegel, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,649
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1979, 2937541
Int. Cl.³ B65H 9/00
U.S. Cl. 271—236 4 Claims



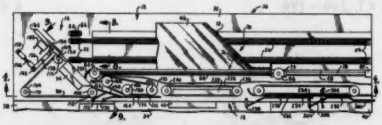
1. A sheet feeder for feeding of sheets from a pile to the inlet gripper of a printing press comprising in combination, a downwardly angled feed table, a feeding device for feeding sheets from the pile in succession along the table, means including a periodically interposed front stop for stopping a sheet at the end of the table in position for pick-up by the gripper in the press, a side guide at the edge of the table and extending upwardly a short distance therefrom for engaging the lateral edge of the sheet, a lateral wiping assembly for wiping the sheet toward the side guide as it settles against the front stop, a leaf spring for pressing the sheet toward the table in the region of the side guide, the spring having an upstream end and a downstream end, a holder engaging the upstream end for holding the spring at a shallow angle so that the sheet is flatly engaged by the downstream end in a slightly sprung condition, and an articulated joint between the holder and the leaf spring permitting the downstream end of the leaf spring to swing laterally with the sheet into angled position as the sheet undergoes lateral wiping movement toward the side guide.

4,328,962

MAIL SORTING MACHINE

Roy Akers, Lafayette County, Mo., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 48,798, Jun. 15, 1979, abandoned. This application Dec. 19, 1980, Ser. No. 218,274
Int. Cl.³ B65H 3/12, 5/02, 1/02
U.S. Cl. 271—12 28 Claims



9. An envelope feeder apparatus for separating a plurality of envelopes from one another, said apparatus comprising:

a structural frame presenting a magazine thereon, said magazine being adapted to receive a plurality of envelopes to be sorted;

means for advancing said envelopes to be sorted along said magazine to deliver the lead envelope to an envelope feed station;

a transport channel extending along at least a portion of said apparatus, said transport channel being disposed in a parallel relationship to said magazine;

means for conveying envelopes through said transport channel;

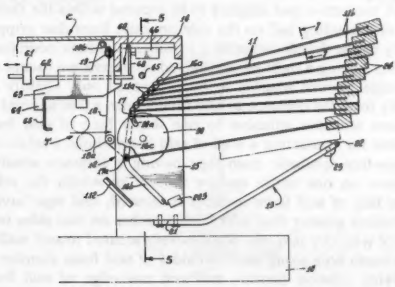
separator means located at the envelope feed station for separating the lead envelope from the remaining envelopes and conveying the lead envelope away from the envelope feed station along a path oriented obliquely to both the magazine and transport channel; and

a substantially straight guide rail positioned to intersect the lead envelope as it is being conveyed away from said feed station by said separator means, said guide rail extending from said path to said transport channel at an obtuse orientation relative to the path and the channel to deflect and guide the lead envelope through a turn covering less than 90° from said path to said transport channel.

4,328,963
COMPACT SORTER

R. Clark DuBois, Fairfield, and John C. Hamma, Milford, both of Conn., assignors to Gradco Dendoki, Inc., Newport Beach, Calif.

Filed Nov. 29, 1979, Ser. No. 98,546
Int. Cl.³ B65H *39/11*
U.S. Cl. 271—293 16 Claims



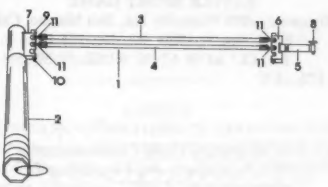
1. An improved sorting apparatus of the shiftable bin type including a frame structure having means for mounting the sorting apparatus at the sheet outlet from a copying machine, sorting bins pivotally shiftable relative to one another to provide a wide sheet entry between bins at said outlet, and means for shifting the bins, the improvement wherein said bins have ends remote from said outlet freely pivotally mounted one on the other enabling vertical separation of said remote ends from one another and ends adjacent said outlet mounted for pivotal movement on horizontal axes and for vertical shifting movement past said outlet, and said means for shifting said bins engages successive bins at said ends adjacent to said outlet to move the latter successively pivotally from one side of said outlet to the other in opposite directions, spring means biasing said ends adjacent said outlet into engagement with said shifting means, and including control means to intermittently effect operation of said shifting means in opposite directions following passage into successive bins from the copying machine of a selected number of sheets.

4,328,964
MULTI-SPORT EXERCISER

Thomas J. Walls, 2103 May Ave., Muncie, Ind. 47302

Filed Sep. 10, 1979, Ser. No. 74,224
Int. Cl.³ A63B *21/04*
U.S. Cl. 272—136 3 Claims

1. A multi-sport exerciser apparatus comprising a plurality of handles each of which is adapted to be grasped in a person's hand and is adapted to be detachably coupled to a plurality of elastic ropes, a plurality of elastic ropes each of which has two ends wherein one end is adapted to be detachably coupled to any of the plurality of handles and the other end is adapted to be detachably coupled to an anchor bracket, a detached anchor bracket adapted to receive any of the aforesaid plurality of elastic ropes detachably coupled thereto and having a web strap attached thereto which web strap is adapted to detachably couple the aforesaid anchor bracket to a building, said web strap having two ends wherein one end is attached to the anchor bracket and the other end is provided with slot means adapted to receive a safety pin removably and slidably inserted therein, said strap being adapted to be detachably coupled to a building by inserting the said strap between an open door of said building and its frame with one of the ends of said strap on one side of the said door and the other of the said ends on the opposite side of the said door and closing the said door; a safety

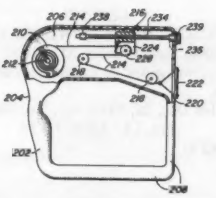


pin having a crossbar at one end thereof and adapted to be removably and slidably inserted into the slot means in the web strap and adapted to prevent the strap and pin from coming through an opening between a closed door and its frame when the said safety pin is positioned on one side of the said closed door and tension is applied to the other end of the said web strap from the other side of the said closed door, a first coupling means for detachably coupling one end of any of the plurality of elastic ropes to any of the plurality of handles, and a second coupling means for detachably coupling the other end of any of the plurality of elastic ropes to the detached anchor bracket.

4,328,965
PORTABLE ARCHERY MUSCLE DEVELOPER

Raymond C. Hatfield, 1999 Lancaster La., Wheaton, Ill. 60187

Filed Jun. 16, 1980, Ser. No. 159,638
Int. Cl.³ A63B *21/02*
U.S. Cl. 272—137 7 Claims



1. An archery exerciser comprising:

first handle means for receiving the forward, bow holding hand of an archer at a position extended at arm's length from said archer, said first handle means comprising a housing including a central aperture defining a formed handle portion, said aperture being sized and shaped to provide adequate clearance for an operator's wrist and forearm during utilization of the exerciser;

second handle means for receiving the string pulling hand of said archer;

connecting means for resiliently connecting said first handle means to said second handle means, said connecting means mounted within said housing and comprising: a spring loaded pulley, cable means wrapped around said pulley in a direction to increase the loading when said cable means is unwound from said pulley, alignment means for routing said cable means from said pulley through the sidewall of

said housing, and means for securing said cable means to said second handle means; and

spring control means for adjustably controlling the state of compression of said spring loaded pulley to vary the pull resistance of said exerciser, said spring control means comprising adjustable means mounted within said housing and engaging said cable means whereby said archer can simulate the action of pulling a bow by pulling said second handle means away from said first handle means.

4,328,966

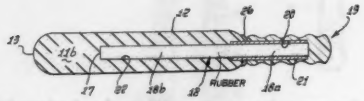
BATTLE SPORT GAME

Yukio Miyamoto, 2590 Wetherby Rd., San Marino, Calif. 91108

Filed Aug. 4, 1980, Ser. No. 175,131

Int. Cl.³ A63B *67/00, 69/02, 71/08*

U.S. Cl. 273—1 F **9 Claims**



1. In a battle sport game, a bat comprising

(a) an axially elongated body consisting essentially of lightweight, resiliently compressive material,

(b) a handle at one end of the body, and

(c) flexible connecting structure extending internally of the body and projecting therefrom, for interconnecting the handle and body, said flexible connecting structure comprising an elongated rubber tube projecting a substantial distance into said elongated body, and also projecting into said handle,

(d) and a protective flexible sleeve extending about the rubber tube both within the handle and within the body, the sleeve bridging the junction between the handle and body and terminating a short distance into the body to allow the rubber tube projecting beyond the sleeve in the body to bend laterally with the body and define a corresponding bent position.

4,328,967

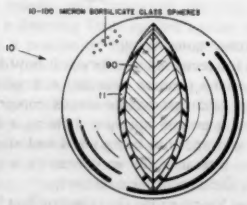
LIGHTWEIGHT BOWLING BALL

Samuel J. Orlando, and Charles M. Miller, Jr., both of San Antonio, Tex., assignors to Columbia Industries, Inc., San Antonio, Tex.

Filed Dec. 26, 1979, Ser. No. 106,749

Int. Cl.³ A63B *37/14*

U.S. Cl. 273—63'G **7 Claims**



1. A bowling ball comprising an inner core and at least one thermosetting resin shell about said inner core, said shell comprising a cured thermosetting resin having substantially uniformly distributed therethrough sufficient lightweight particles to reduce the weight per unit volume of said shell by at least five percent below that of the same volume of said cured thermosetting resin shell without said lightweight particles, substantially all of said lightweight particles having an average thickness within the range of from 10 microns to 100 microns.

4,328,968

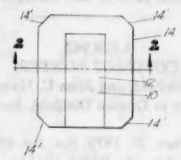
PROTECTIVE PAD FOR THE THUMB HOLE OF A BOWLING BALL

Chuck Hacker, P. O. Box 468, Fairfield, Ohio 45014

Continuation-in-part of Ser. No. 946,544, Sep. 28, 1978, abandoned. This application Apr. 4, 1980, Ser. No. 137,273

Int. Cl.³ A63B *65/06, 37/00*

U.S. Cl. 273—63 B **4 Claims**



1. A protective pad adapted to be secured within the thumb hole of a bowling ball on the side opposite from that gripped tightly by the thumb comprising a resilient synthetic resin foam member having a right parallelepiped configuration except for one edge thereof adapted to be positioned only slightly inwardly from the entrance to said thumb hole, a film secured by pressure sensitive adhesive to one major face of said foam member for contacting a wall of said thumb hole, a relatively friction-free synthetic resin tape having a pressure sensitive adhesive on one entire surface thereof to which the other major face of said foam member is secured, said tape having dimensions greater than said foam member on two sides only thereof whereby said tape is adhesively secured to said wall of said thumb hole along said two sides of said foam member in overlying relation thereto, and said one edge of said foam member being gradually reduced in thickness from a position adjacent the side to which said tape is secured to provide a tapered edge to ease entry of the thumb into the thumb hole.

4,328,969

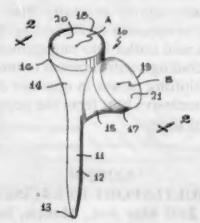
GOLF TEE

Edwin S. Wright, 10614 Riverside Dr., North Hollywood, Calif. 91602

Filed Sep. 29, 1980, Ser. No. 191,362

Int. Cl.³ A63B *57/00*

U.S. Cl. 273—203 **4 Claims**



1. A golf tee comprising the combination of:

a single, elongated shaft having one end which is tapered to terminate in a point;

said shaft having an opposite end which is provided with a double-headed cup-like arrangement for selectively supporting a golf ball;

each of said cup-like arrangements having a concave surface for supporting a golf ball;

a selected one of said concave surfaces having its center

lying on the central longitudinal axis of said shaft and said other concave surface having its center lying on an axis angularly displaced thereto;

said double headed cup-like arrangement includes a pair of thickened portions integral with said shaft and each portion having a central axis;

the central axis of one of said portions lying on and concentric with the central axis of said shaft and the central axis of the other of said portions lying at a 45 degree angle to the central axis of said shaft;

a selected one of said thickened portions supports a golf ball; and

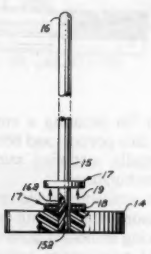
the other of said thickened portions adapted to receive and transfer insertion loads into said shaft during an implanting procedure of said shaft into the ground.

4,328,970

MAGNETIC BOARD GAME

Scott E. Manno, Sr., 10025 St. Clair Ave., Fairview Heights, Ill. 62208

Filed Dec. 18, 1978, Ser. No. 970,635
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—239 **4 Claims**



1. A game apparatus for a plurality of players comprising, a base means for each player, said bases each having indicia thereon distinct from the indicia on each other base, a single upstanding nonferrous peg fixed to each said base, each said peg having indicia thereon corresponding to the indicia on said base to which is it affixed, a plurality of sets of magnetic washers, dimensioned such that a plurality of washers may be placed over each said peg, said washers having their polarities at their side faces such that when two washers are placed over the same peg with like polarity faces adjacent each other the bottom piece is capable of supporting the upper piece in a vertically spaced apart relationship, each set of magnetic washers having indicia thereon corresponding to the said indicia on a different one of said bases, and a chance device capable of randomly indicating indicia corresponding to the said indicia on each said base.

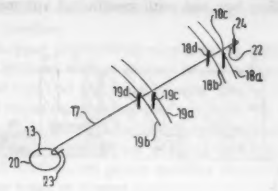
4,328,971

DARTBOARD

James H. Stone, and Stephen H. Stone, both of Lincolnshire, England, assignors to Dunlop Limited, London, England

Filed Apr. 16, 1980, Ser. No. 140,749
Claims priority, application United Kingdom, May 3, 1979, 7915499; Jul. 5, 1979, 7923452
Int. Cl.³ F41J *3/00*
U.S. Cl. 273—408 **11 Claims**

1. A dartboard having a grid comprising straight high tensile radial wires, an inner ring and an outer ring which enclose the playing area of the dartboard, said radial wires running from the inner ring to the outer ring, a plurality of endless tensile wires crossing the radial wires, said endless wires defining the rings of the target areas of the dartboard, and a plurality of pegs projecting from the playing area of the dartboard and



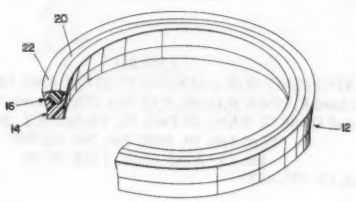
arranged in concentric circles and around which the endless wires are held in tension.

4,328,972

SEAL RING AND METHOD OF MANUFACTURE

Kenneth R. Albertson, West Valley City, and Ralph E. Peterson, Salt Lake City, both of Utah, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 10, 1980, Ser. No. 214,922
Int. Cl.³ F16J *15/32*; B32B *31/06, 31/18*
U.S. Cl. 277—1 **9 Claims**



1. A U-shaped annular packing member comprising a shell portion and an actuator portion; said shell being an integral one piece member of a deformable incompressible material, said shell having in transverse cross section, a base and two legs extending from said base, said legs terminating at a free end and defining a cavity therebetween; said cavity being substantially filled with liquid elastomer and cured in situ to form said actuator portion thereby providing the packing member with closely controllable dimensions while providing good sealing properties.

4,328,973

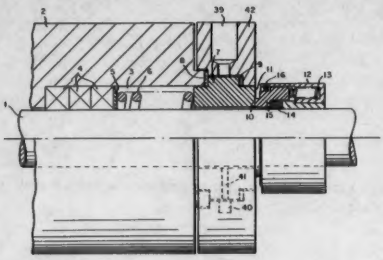
SHAFT SEAL WITH FLUID PRESSURE AND SPRING BIAS

Albert J. Delbridge, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 17, 1980, Ser. No. 141,123
Int. Cl.³ F16J *15/38, 15/48*
U.S. Cl. 277—3 **6 Claims**

1. A shaft seal comprising a mechanical seal in combination with packing which is maintained under substantially constant compression within an annular space formed by the shaft and the interior wall of a stuffing box mounted concentrically with respect to said shaft, said packing being located within said annular space at a position along the shaft closest to the process stream end of the shaft, said mechanical seal being located at a position along the shaft further away from the process stream end of the shaft than the packing thereby forming an annular cavity bounded by the shaft, the interior wall of the stuffing box, the packing and the mechanical seal, a means for providing a fluid under pressure to said cavity, the material of construction, configuration and compression to the packing being such that when said fluid is provided to said cavity under

pressure greater than the pressure of the process stream, the fluid will flow through the packing into the process stream with sufficient velocity to prevent process fluid from entering the stuffing box and with insufficient volume rate of flow to



cause significant dilution of the process fluid, wherein the packing is maintained under substantially constant compression by means of at least one coil spring exerting a force thereon of approximately 10–100 pounds.

4,328,974

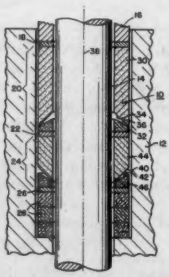
STUFFING BOX PACKING SYSTEM AND METHOD

Richard E. White, R.D. #1, P.O. Box 395, Newark, N.Y. 14512, and David G. White, 37 Park St., Phelps, N.Y. 14532

Filed Feb. 19, 1980, Ser. No. 122,365

Int. Cl.³ F16J *15/24;* F16K *41/04*

U.S. Cl. 277—122 **82 Claims**



1. A packing for a stuffing box comprising:

(a) a low density graphite preform ring that is compressible and re-formable during packing installation to form at least one of an I.D. or an O.D. seal, and

(b) means, when axial compressive force is applied to said packing, for forcing the material adjacent one radial edge of one end of said preform ring to move axially and radially in the direction away from said preform ring, and for further compressing said material into an impervious and effective seal, said forcing means being a higher density adapter ring having one end thereof adjacent said one end of said preform ring, said rings having facing surfaces each at an acute angle to the longitudinal axis of said packing and wherein said angles are different, the other end of said adapter ring having a surface substantially perpendicular to the longitudinal axis of said packing, and said angled facing surface of said adapter ring being flat and extending across the entire width of said adapter ring.

4,328,975

QUICK-CHANGE MECHANISM FOR STANDARD MILLING SPINDLES

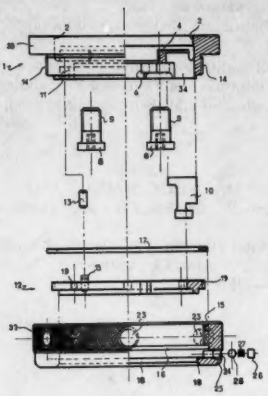
Jean-Pierre Heguy; Jean-Michel Heguy, and Jean-Leon Heguy, all of Quartier Etchartia-Minnotz, 64240 Hasparren, France

Filed Mar. 1, 1979, Ser. No. 16,516

Claims priority, application France, Mar. 2, 1978, 78 06881

Int. Cl.³ B23B *31/06, 31/44;* B23C *5/26*

U.S. Cl. 279—91 **12 Claims**



1. An adaptor for securing a conically-shaped tool to a spindle having a face portion, and being formed with a conical opening substantially matching said conically-shaped tool, comprising in combination:

a first member securable to said spindle, having a ring portion, two tenons integral with said ring portion, and two inwardly facing embossed portions integral with said ring portion, said two tenons being disposed diametrically opposite one another, and being adapted to operatively abut said face portion of said spindle,

said embossed portions being displaced at an angle of about 45° with respect to said two tenons, respectively, each embossed portion being formed with a hole, said spindle having threaded openings therein, said embossed portions being adapted to be operatively alignable with said spindle for screws to be passed through said holes to mate with said threaded openings, respectively, so as to secure said first member to said spindle,

a second member arranged to be threaded onto said first member, said first and second members having throughgoing bores, respectively, for receiving the tool, said second member including cam means,

cam follower means receivable by said second member, and including two shoulders disposed diametrically opposite one another, and arranged to be juxtaposed with said embossed portions in said locked position, so as to maintain said tool frictionally locked to said spindle, and being formed with a segmental groove extending over an angle of about 90°,

holding means in contact with said cam follower means, and with said second member,

an ejector member adapted to be in contact with said tool,

said ejector member and said holding means being positionable between an unlocked position, wherein said tool is releasable from said spindle, and a locked position, wherein said tool is frictionally locked to said spindle by rotation of said second member, at least a portion of said ejector member being slidable in said segmental groove,

rotation limiting means cooperating with said cam follower means and said first member for limiting rotation of said cam follower means to a predetermined angle, and

engaging means disposed on said cam follower means

adapted to engage said tool to, and disengaging it from, said engaging means within first and second relative position ranges of said engaging means with respect to said tool, respectively,

whereby rotation of said second member in a direction so as to thread said second member onto said first member within said second position range causes said cam follower means to follow rotation of said second member until it reaches said predetermined angle, and rotation of said second member beyond said predetermined angle in said one direction within said second position range causes said second member to wedge said tool into the opening of the spindle,

while rotation of said second member in a direction so as to unthread said second member from said first member within said first position range causes said cam follower means driven by said cam means to urge said ejector member to travel in a direction so as to release said tool from said spindle.

4,328,976
SEAT BELT TENSIONING DEVICE

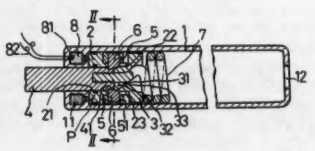
Noboru Tsuge, Kariya; Satosi Kuwakado, and Toshiaki Shimogawa, both of Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 31, 1980, Ser. No. 174,177

Claims priority, application Japan, Aug. 2, 1979, 54-107086[U]

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—806 **5 Claims**



1. A seat belt tensioning device for a vehicle comprising:

a cylinder;

a first piston member and a second piston member which are disposed adjacent to each other within said cylinder so as to slide in one direction;

said first piston member having an axially extending through hole and a plurality of axially extending guide slots which are communicated with said through hole;

said second piston member having an axially extending through hole and a taper portion formed in one end thereof opposing to said first piston member, the diameter of said taper portion being enlarged in said piston moving direction;

a rod which is slidably inserted within said through hole of said first piston member;

one end of said rod being connected to a seat belt outside of said cylinder;

the other end of said rod being formed into a taper portion the diameter of which is enlarged in the piston moving direction;

said one end of said second piston member and said other end of said rod being in contact with each other to form a conical continuous inclined surface composed of the taper portions of said second piston member and said rod;

a deformable member which is composed of a long strip shaped metallic member having curved portions;

said curved portions being plastically deformed and elongated due to a predetermined tension force;

said deformable member being disposed adjacent to said second piston member within said cylinder;

one end of said deformable member being connected to said rod, passing through said through hole of said second piston member;

a stopper means composed of a plurality of stopper pieces which are slidably inserted within said guide slots of said first piston member;

each of said stopper pieces being supported by said conical continuous inclined surface formed in said second piston member and said rod and lifted by said taper portions of said second piston member and said rod due to the relative movement of said piston and said deformable member; and

a piston operating means which operates said first piston member and said second piston member to move within said cylinder upon an urgent time.

4,328,977
RECORDING PAPER CAPABLE OF RECORDING IMAGES IN TWO COLORS

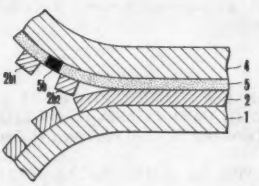
Masaru Ozawa; Yuji Ooba, and Toshio Shimizu, all of Yokosuka, Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Aug. 27, 1980, Ser. No. 181,896

Claims priority, application Japan, Aug. 31, 1979, 54-110466

Int. Cl.³ B41L *1/20*

U.S. Cl. 282—27.5 **2 Claims**



1. Two color recording paper comprising:

a thermosensitive recording paper, an ink film including a film base and an ink layer coating on said film base, said ink layer comprising a mixture of a colored material and a thermoplastic material, wherein said mixture is a solid at ordinary temperature and a fluid at a first high temperature, said ink film adapted to transfer image patterns of a first hue to a surface of said thermosensitive recording paper;

said thermosensitive recording paper including a supporting substrate and a coloring layer coating on said substrate, said coloring layer coating disposed adjacent to and mating with said ink layer coating at a coloring surface and an ink surface of said coloring layer and said ink layer, respectively, said coloring layer having a developer adapted to color in a second hue at a temperature greater than said first high temperature;

whereby images on said recording paper are formed in two colors according to a predetermined configuration.

4,328,978
IDENTIFICATION DEVICE FOR HOSPITAL PATIENTS

John T. McLaughlin, 1839 Risa Pl., Glendale, Calif. 91208

Filed Sep. 30, 1980, Ser. No. 192,616

Int. Cl.³ B42D *15/00*; G09F *3/14*

U.S. Cl. 283—7 **6 Claims**

1. An identification device for hospital patients including, in combination:

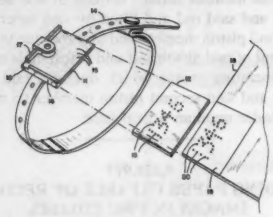
(a) a holder having a receiving surface on its top side for receiving a patient's identification card which card has been perforated with a patient identifying number;

(b) means for securing said holder to the patient whose identification number is carried by the holder;

(c) light emitting means on said holder for passing light

through the perforations defining said identification number; and

(d) registration means on said holder for receiving and effecting registration of at least a portion of an order blank which has been perforated with a patient's identifying number



whereby when said latter mentioned identifying number is the same as the identifying number on the patient's identifying card carried by the holder, said light will pass through both numbers so that proper identity of the order with the patient is assured, whereas if the numbers are different, such will be immediately indicated by a blocking of at least a portion of the light so that it is known that the order is not for the particular patient in question.

4,328,979

ADAPTOR CONNECTING PIECE FOR CONDUITS DESIGNED TO CARRY GASEOUS OR LIQUID MEDIA

Kurt Stoll, Lenzhalde 72, 7300 Esslingen/N, Fed. Rep. of Germany

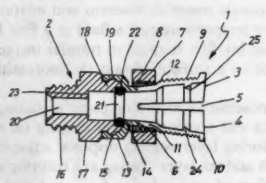
Filed Jul. 16, 1980, Ser. No. 169,321

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 7920496[U]

The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.

Int. Cl.³ F16L *33/00*

U.S. Cl. 285—174 **4 Claims**



1. A connecting piece for supply lines carrying gaseous or fluid media, comprising:

a first elongated and hollow connecting member having a first central body segment with an enlarged end structure on one end terminating in a first axially facing surface which has a first axially facing recess therein communicating with the interior of said hollow connecting member and opening in a direction remote from said first central body segment, the bottom of said first recess defining a second axially facing surface extending parallel to said first surface, said first recess having an annular recess on the internal surface thereof intermediate said first and second surfaces, a supply line clamping means connected to said first central body segment on an end thereof remote from said enlarged end structure;

a second elongated and hollow connecting member having a second central body segment with an end segment extending axially away from said second central body segment and a sleeve segment extending axially away from said second central body segment on a side thereof opposite said end segment, said sleeve segment having a cross-sectional size less than the cross-sectional size of said second central body segment to thereby define a third axially facing surface facing in a direction toward said first surface on said first connecting member, said sleeve terminating in a fourth axially facing surface parallel to said third surface, said fourth surface having a second axially facing recess therein communicating with the interior of said second connecting member, the bottom of said second recess defining a fifth axially facing surface extending parallel to said third and fourth surfaces, the axial spacing between said third and fourth surfaces on said second connecting member being equal to the axial spacing between said first and second surfaces on said first connecting member, said sleeve segment having an annular projection on the external surface thereof intermediate said third and fourth surfaces;

said sleeve segment being received in said first recess with said third surface thereof engaging said first surface and with said fourth surface engaging said second surface, a compressible seal member received in said second recess and being compressed between said second and fifth surfaces, said annular projection being operatively received in said annular recess to hold said first and second connecting members in a coupled relationship and said first and third surfaces as well as said second and fourth surfaces in engagement with each other; and

said supply line clamping means comprising:

a collet chuck section having plural segments diverging radially outwardly from said enlarged end structure, said collet chuck section having an external thread thereon which is initially conical when said plural segments of said collet chuck section diverge radially outwardly; and

an internally threaded locking ring adapted to threadedly engage said external thread to urge said plural segments into a cylindrical arrangement as said locking ring moves along the length of said plural segments.

4,328,980

COUPLING BETWEEN MECHANICAL ELEMENTS

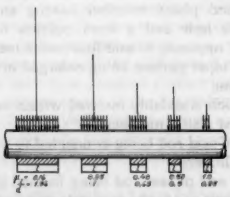
Olov M. Normark, Astrakangatan 2, Vällingby, Sweden (S-162 32)

Continuation of Ser. No. 956,431, Oct. 31, 1978, abandoned. This application Sep. 15, 1980, Ser. No. 186,962

Claims priority, application Sweden, May 4, 1977, 7705193

Int. Cl.³ F16L *19/00*

U.S. Cl. 285—341 **4 Claims**



1. A frictional, non-deforming coupling for mechanically connecting an elongated element to a body without deforming the elongated element comprising, a contact member having the shape of a tubular sleeve embracing the element to be coupled, a slot through the wall of said contact member to allow said contact member to be diametrically reduced in size, a force transforming member surrounding said contact member for applying radially inward pressure against said contact member causing said contact member to grip against said element, said contact member and said force transforming member having complimentary interengaging tapered surfaces, the tapered surface of said force transforming member

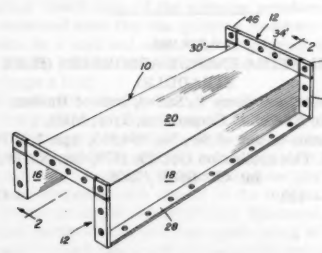
being axially shorter than the tapered surface of said contact member, and force applying means engaging said force transforming member for axially moving said force transforming member relative to said contact member with mutual sliding of said tapered surfaces from an unstressed position of said force transforming member relative to said contact member into a stressed position of said force transforming member relative to said contact member in which stressed position maximum radial force is applied to said contact member, the tapered surface of said force transforming member having a location on said tapered surface of said contact member when said members are in said stressed position in which the radial force trnasmitted to said contact member by said force transforming member is substantially evenly distributed axially along the length of said contact member, said force applying means having a screw thread cooperatively engagable with a mating screw thread on said body so that rotation of said force applying means when said screw threads are engaged will produce the coupling force.

4,328,981

DUCT STRUCTURE WITH REINFORCED END FLANGES

Carl B. Greene, Jr., and Carl B. Greene, III, both of P.O. Box 948, Chickasha, Okla. 73018

Filed Sep. 19, 1980, Ser. No. 188,232
Int. Cl.³ F16L *13/02*
U.S. Cl. 285—286 **6 Claims**



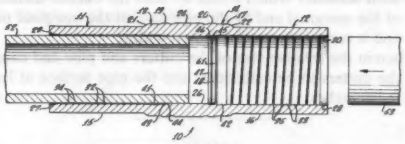
1. A sheet metal duct section component including at least one pair of adjacent longitudinally extending integral panel portions relatively angulated about a longitudinal zone connecting adjacent longitudinal marginal portions of said panel portion, at least one pair of corresponding ends of said panel portions including individually bendable flanges extending endwise outwardly therefrom, said flanges being bent relative to and toward corresponding sides of said panel portions into generally coplanar relation and including outer end extremities bent backwardly over said flanges to define double thickness flanges, a filler plate of a thickness over its entirety at least generally equal to said double thickness flanges and including an outside corner defined by adjacent relatively angulated marginal edges of said filler plate substantially comforming to the inside corner formed by adjacent marginal portions of said double thickness flanges, said outside corner of said filler plate being positioned and secured, by welding, in said inside corner with said filler plate substantially coplanar with said double thickness flanges, said double thickness flanges and said filler plate defining a duct section end mounting flange assembly for end abutting of said duct section against and securement of said mounting flange assembly to a second duct section wall.

4,328,982

FLUID FITTING

Roger D. Christianson, Los Alamitos, Calif., assignor to The Deutsch Company Metal Components Division, Los Angeles, Calif.

Continuation-in-part of Ser. No. 955,494, Oct. 27, 1978, abandoned. This application Sep. 12, 1979, Ser. No. 74,874
Int. Cl.³ F16L *17/02*
U.S. Cl. 285—351 **26 Claims**



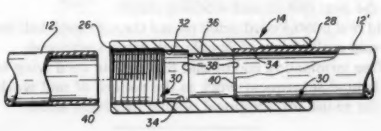
1. A fluid fitting comprising
a sleeve having
a first portion at one end thereof,
and a second portion inwardly to said end thereof,
said first portion having ridge means on the inner periphery thereof adapted to penetrate the periphery of a tubular member inserted therein for forming a retention thereto,
the inner periphery of said second portion including an annular land, and an annular groove adjacent said land, said groove including a relatively deep central portion and a relatively shallow portion on either side of said relatively deep portion so that the wall of said groove forms intersecting corners between said relatively deep portion and said relatively shallow portions, whereby upon application of an external inward radial force said land and said wall of said groove at said corners is forced against the periphery of a tubular member received in said sleeve for forming a seal therewith.

4,328,983

POSITIVE SEAL STEEL COUPLING APPARATUS AND METHOD THEREFOR

Jack E. Gibson, 4905 Pepperidge Pl., Odessa, Tex. 79761

Filed Jun. 15, 1979, Ser. No. 48,780
Int. Cl.³ F16L *19/00*
U.S. Cl. 285—382 **5 Claims**



5. Improvements in pipelines comprising joining one constant diameter marginal end of a pipe to another pipe by the provision of a connector device;
said connector device has an axial passageway formed therethrough, a marginal length of said axial passageway is made into a pipe receiving socket;
a marginal length of said socket includes circumferentially extending constant diameter cutters which are of an inside diameter which is 0.030–0.080 inches smaller than the constant diameter marginal end of a pipe to be joined into a pipeline by the connector device;
said cutters are in the form of a circumferentially extending blade which is increased in thickness in a direction radially away from the axial centerline of the connector device, said blades are inclined towards a medial part of the con-

nectors device and in a direction away from the pipe end to be received therewithin;

so that a pipe end can be forced into the socket with sufficient force to deform the surfaces between the marginal end of the pipe and the connector device;

wherein a sealant is applied to the entire periphery of the marginal end of the pipe;

said cutters are formed about a first marginal length of the socket to leave a smooth bore along a second marginal length of the socket; said smooth bore has an inside constant diameter which is smaller than the outside diameter of the marginal end of the pipe so that the marginal pipe end is resistingly received therewithin;

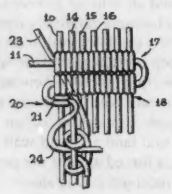
wherein the relative size of the cutters and pipe end causes the cutters to be embedded into the pipe surface at least 0.010 inches.

4,328,984

WORK AND METHOD FOR INCLUSION OF THREE OR MORE CORDS OF DIFFERENT COLORS INTO A CAVENDOLI TYPE MACRAME PATTERN

Juandine B. Hampton, 1294 Fuller Ave., Simi Valley, Calif. 93065

Filed May 2, 1980, Ser. No. 146,069
Int. Cl.³ D04C *5/00*
U.S. Cl. 289—1.2 **7 Claims**



1. A knotted workpiece defining a desired pattern comprising:

a plurality of working cords arranged in spaced apart rows:

a main knot holding cord woven through and tied to respective ones of said working cords in a multiplicity of double half hitch knots;

a first bobbin cord of a different color than said working cords and said main holding cord introduced into the workpiece adjacent a pair of double half hitch knots on the next one of said working cords;

said first bobbin cord being passed through each half hitch of said multiplicity of double half hitch knots; and

a free terminating end of said first bobbin cord lying hidden behind subsequent work in the pattern of said workpiece for re-use for additional double half hitch knots.

4,328,985

TIMING APPARATUS FOR DELAYING OPENING OF DOORS

Emanuel L. Logan, Arlington, Va., assignor to Reliable Security Systems, Inc., Cockeysville, Md.

Continuation-in-part of Ser. No. 65,491, Aug. 10, 1979, abandoned, Ser. No. 929,968, Aug. 1, 1978, and Ser. No. 57,724, Jun. 25, 1979. This application Feb. 29, 1980, Ser. No. 125,995
Int. Cl.³ E05C *15/02*
U.S. Cl. 292—201 **31 Claims**

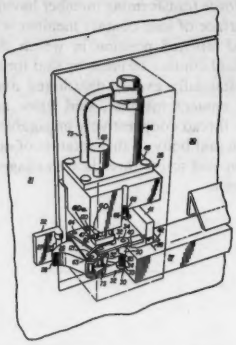
1. A system for securing at least one emergency exit door of an enclosure while providing for emergency opening of the emergency exit door to provide egress from the enclosure, the system comprising:

securing means for preventing the door from opening when a securing means is in a first mode; and for allowing the door to open when the securing means is in the second mode;

retaining means included with the securing means for retaining the securing means in the first mode;

releasing means connected to the retaining means and operating the retaining means for allowing the securing means to shift to the second mode;

electrical switch means for providing a signal indicating that an attempt to open the door is occurring;



electrical timing means connected to the electrical switch means and started by the signal from the electrical switch means to generate a release signal after a predetermined time interval, the electrical timing means being connected to the releasing means to thereby allow the securing means to shift from the first mode to the second mode; and

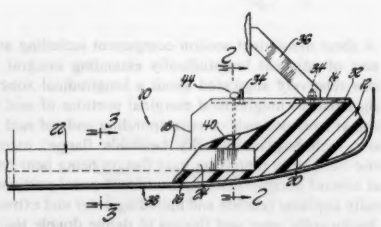
means for indicating that an attempt has been made to open the door.

4,328,986

MULTI-MEDIA ENERGY ABSORBERS (FLEX STRADDLE)

Peter A. Weller, and Jerry V. Scrivo, both of Durham, N.H., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 894,593, Apr. 7, 1978, abandoned. This application Oct. 29, 1979, Ser. No. 89,593
Int. Cl.³ B60R *19/06*
U.S. Cl. 293—120 **6 Claims**



1. An elongated energy-absorbing bumper assembly comprising; energy-absorbing elastomeric material extending between a rear mounting surface and a front impact surface, said material defining a hollow recess extending thereinto from said rear mounting surface and positioned between the ends of said assembly with said material extending to said rear mounting surface at both ends of said hollow recess to define block-like end portions of said elastomeric material, a structural member extending forwardly of said recess between said block-like end portions with the ends of said member being completely embedded in and completely encapsulated by said block-like end portions of said elastomeric material so that said block-like end

portions of said elastomeric material are the sole support and means of positioning said member relative to said elastomeric material so that said member is allowed unguided movement with said elastomeric material in multiple directions upon impact.

4,328,987

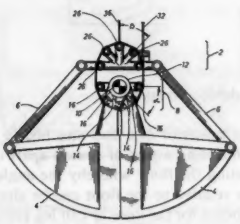
ROPE-ACTUATED IMPLEMENTS

Adolph F. Zoudlik, 16832 Harpers Ferry Ave., Baton Rouge, La. 70816

Continuation-in-part of Ser. No. 943,851, Sep. 19, 1978, abandoned. This application Sep. 11, 1979, Ser. No. 72,178

Int. Cl.³ B66C 3/06

U.S. Cl. 294—111 **31 Claims**



1. A rope-actuated load lifting and carrying assembly, comprising:

(a) a support structure;

(b) at least two gripping members for carrying a load;

(c) a corner arm pivotally connecting each said gripping member to said support structure; and

(d) a vertically moveable center pin assembly below the support structure, this assembly including a center pin about which each of the gripping members is pivotally connected such that the gripping members can close to take on a load and such that the gripping members can open by pivotal movement around the center pin to discharge a load;

said center pin assembly further comprising at least one first rope guide rotationally mounted below the pivotal axis of the center pin, such that a rope may be reeved over this first rope guide for applying a vertical upward force to the center pin assembly to cause the center pin assembly to move vertically with respect to the support structure to thereby cause the pivotal closing movement of the gripping members, this first rope guide being at all times located beneath the center pin during the opening and closing motions of the gripping members;

the support structure also further comprising a plurality of second rope guides disposed such that the axis of at least one of the second rope guides lies above a horizontal plane through the points of connection of said corner arms to the support structure, with the axis of none of the rope guides associated with said support structure lying below said horizontal plane; and

a separate support member for supporting said first rope guide and said plurality of second rope guides.

4,328,988

DROPSIDE PICKUP

Albert E. Patterson, Greenfield, Ind., and Timothy C. Pollard, West Bloomfield, Mich., assignors to C. E. Pollard Company

Filed Aug. 7, 1980, Ser. No. 176,141

Int. Cl.³ B60P 9/00

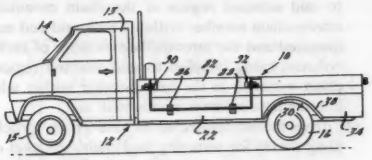
U.S. Cl. 296—10 **9 Claims**

1. A bed for a pickup truck, comprising

a floor and front, rear, and two sidewalls mounted to said floor and having portions extending upwardly from the periphery of said floor, said walls having smooth surfaces exterior of the bed, the cross-section of each of said walls forming a smooth contour along said exterior surface thereof, at least one of said sidewalls having a recess therein;

hinge means attached to said sidewall at said recess;

at least one gate attached by said hinge means to said sidewall, within said recess, having a smooth exterior surface, the cross-section of said gate having a contour matching the portion of said sidewall adjacent said recess, latch means for securing said gate to said sidewall in a latched position wherein said gate contour and the contour of said sidewall adjacent said recess match when said latch means secures said gate to said sidewall;



a chassis for said pickup truck, said chassis having a set of front wheels and a set of rear wheels; and

means for mounting said bed on said chassis, wherein when said bed is mounted on said chassis, said recess in said sidewall is located between said set of front wheels and said set of rear wheels;

wherein said bed has joist means for supporting loads on said floor, said joist means comprising

inboard joists secured to said chassis, and outboard joists secured to said bed below said floor; and

wherein the floor of said bed is disposed in a horizontal plane below the horizontal line formed by the top portions of said rear wheels.

4,328,989

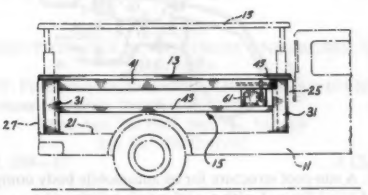
COVER APPARATUS FOR THE CARGO BED OF PICKUP TRUCKS, TRAVEL, TRAILERS AND THE LIKE

Roger B. Childers, P.O. Box 507, Methow, Wash. 98834

Filed Apr. 21, 1980, Ser. No. 142,440

Int. Cl.³ B62D 33/08

U.S. Cl. 296—27 **20 Claims**



1. A cover apparatus for the cargo bed of pickup trucks, travel trailers and the like comprising:

(A) a top; and,

(B) a raising and lowering mechanism coupled to said top for raising and lowering said top, said raising and lowering mechanism comprising:

(1) a plurality of telescoping columns, each of said telescoping columns including a base member, at least one intermediate member and an end member telescoped together;

(2) frame means affixed to said base members of said plurality of columns for rigidly mounting said plurality of columns in vertical positions, said top being mounted atop the end members of said plurality of telescoping columns:

(B 3) chain/sprocket coupling means running between said telescoping columns and between said base, at least

one intermediate and end members of said columns for simultaneously extending and retracting said telescoping columns by simultaneously moving said at least one intermediate member of each of said columns with respect to said base member and said end member of each of said columns with respect to said intermediate member, said chain/sprocket coupling means including a plurality of chains, one of said chains being mounted in each of said base and intermediate members, said chains being positioned such that a selected region of each chain is moved along a vertical path of travel when said chain/sprocket coupling means is actuated, the end member of each of said columns being coupled to said selected region of the chain mounted in the intermediate member within which said end member is mounted and the intermediate member of each of said columns being coupled to said selected region of the chain mounted in the base member within which said intermediate member is mounted; and,

(4) drive means connected to said chain/sprocket coupling means for actuating said chain/sprocket coupling means such that said chain/sprocket coupling means simultaneously extends and retracts said telescoping columns by simultaneously moving said plurality of chains.

4,328,990

SUN-ROOF STRUCTURES FOR AUTOMOBILE BODIES

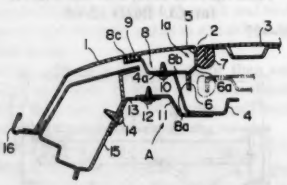
Rihee Yoshida, Hiroshima, Japan, assignor to Toyo Kogyo Co. Ltd., Hiroshima, Japan

Filed Feb. 15, 1980, Ser. No. 121,971

Claims priority, application Japan, Feb. 19, 1979, 54-20039[U]

Int. Cl.³ B60J *7/18*

U.S. Cl. 296—222 **7 Claims**



1. A sun-roof structure for an automobile body comprising a roof panel formed with a roof opening defined by a peripheral edge portion including opposite side edges, said roof panel being formed along said peripheral edge portion with a downwardly directed flange including an upper seat portion defined by a substantially vertical surface of said downwardly directed flange and a lower welding marginal portion, said marginal portion being retreated with respect to the seat portion in a direction opposite to the roof opening, auxiliary panel means disposed along said peripheral edge portion and having an inboard edge portion formed with a downwardly extending flange which is welded to said marginal portion of the roof panel, guide rail means extending beneath the side edges of the roof opening and secured to the auxiliary panel means, a sliding panel having a peripheral edge provided with a sealing member which is adapted to be engaged with said seat portion, said sliding panel being adapted to be guided by said guide rail means.

4,328,991

SITTING DEVICE

Hans C. Mengshoel, Gables gate 41, N-Oslo 2, and Peter Opsvik, Hogtunveien 12, N-1370 Asker, both of Norway

Filed Mar. 26, 1980, Ser. No. 134,217

Claims priority, application Norway, Mar. 30, 1979, 791076

Int. Cl.³ A47C *3/029, 7/50*

U.S. Cl. 297—271 **7 Claims**

1. A sitting device comprising:

a frame,

a seat for the posterior of a user attached to said frame,

said frame including a pair of spaced apart curved runners for contacting the floor whereby the angle of inclination of the seat relative to the floor can be altered,

supporting means for the knee or calf leg portion of the user, said supporting means including a respective support arranged at the front end of a said runner, with the supports of the two runners being spaced apart from each other and with a free space from the front between said supports and between the supports and the seat.

4,328,992

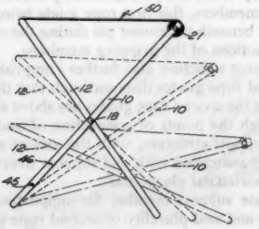
ADJUSTABLE FOOT STOOL

Walter Ohanian, 42 E. Bel Aire Rd., Cranston, R.I. 02920

Filed Jun. 23, 1980, Ser. No. 161,766

Int. Cl.³ A47C *7/50*

U.S. Cl. 297—439 **3 Claims**



1. An adjustable foot stool comprising two pairs of legs, each of said pairs being connected together at the upper end thereof, said legs being pivotally connected together, a flexible member attached to the upper end of one pair of legs, the upper end of the other pair of legs being connected together with a revolvable roller, said roller having a manually reversable ratchet affixed thereto to releasably change its direction of free rotation, the other end of the flexible member attached to said roller whereby the roller may be freely rotated to unwind the flexible member and then locked in position by manually changing the free rotative direction.

4,328,993
BODY SUPPORTING AND SPACING STRUCTURE

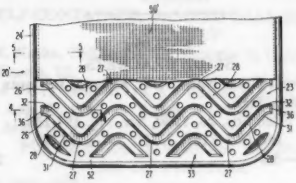
Helen H. Trotman, and Herbert H. Trotman, both of P.O. Box 807, Virginia Beach, Va. 23451

Continuation-in-part of Ser. No. 16,401, Mar. 1, 1979, Pat. No. 4,205,880, which is a continuation-in-part of Ser. No. 909,761, May 26, 1978, abandoned, which is a continuation of Ser. No. 783,263, Mar. 31, 1977, abandoned. This application Feb. 13, 1980, Ser. No. 121,169

The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.

Int. Cl.³ A47C 7/02

U.S. Cl. 297—453 12 Claims



1. A supporting spacing member for use between a supporting surface and a body to be supported comprising

a sheet of resilient plastic material having an upper surface and a lower surface,

a body support area provided by the sheet of plastic material,

the sheet of plastic material including a raised bead surrounding the body support areas,

a plurality of spaced elongated protuberances permanently formed in the sheet of plastic material throughout the body support area and extending downwardly from the upper surface, the elongated protuberances being open at the top and having side walls and bottom walls,

the plurality of elongated protuberances being disposed in spaced adjacent relation to one another and extending from end to end longitudinally continuously along paths each of which extend across a dimension of the body support area which is slightly less than an entire dimension of the body support area, thereby forming a ledge in the sheet of plastic material extending around the body support area between the raised bead and the ends of the elongated protuberances,

portions of the sheet of plastic material which extend between the open tops of spaced adjacent elongated protuberances coating to form in the aggregate a generally flat body engaging structure,

the lowermost surfaces of the bottom walls of protuberances coacting to form in the aggregate a generally flat support structure for engaging the supporting surface,

each of the plurality of elongated protuberances incorporating along its length a plurality of curved direction changing portions and a plurality of portions connecting the curved direction changing portions, successive curved direction changing portions of elongated protuberances alternating in the direction of change along the paths across the body support area,

alternate curved direction changing portions of spaced adjacent elongated protuberances along the paths across the body support area being in overlapping relation to each other looking in the direction the paths extend,

the disposition of elongated protuberances in paths across said dimension of the body support area and the overlapping relationship of the alternate curved direction changing portions resulting in a body support area in which all planes normal to the generally flat body engaging structure will successively intersect a plurality of elongated protuberances at a plurality of spaced points across said dimension of the body support area or will repeatedly intersect alternately disposed portions connecting curved direction changing portions of a single elongated protuberance at a plurality of spaced points across said dimension of the body support area.

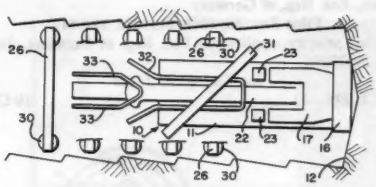
4,328,994
MINING APPARATUS AND METHOD

Gary A. Hakes, Hopewell, N.J., and William E. McCracken, Pittsburgh, Pa., assignors to Lee Norse Company, Pittsburgh, Pa.

Filed May 1, 1980, Ser. No. 145,847

Int. Cl.³ E21D 9/10, 15/58

U.S. Cl. 299—11 13 Claims



8. A method of mining wherein a mining apparatus in a mine entry is positioned under a temporary roof support and near a mine face comprising:

a. dislodging material from the mine face with the mining apparatus wherein the mine face is advanced;

b. transporting dislodged material from the mine face;

c. transporting a cross beam by manual means to a lifting means on the mining apparatus wherein the cross beam is supported by a support means affixed to the mining apparatus as the cross beam is transported to the lifting means;

d. lifting the cross beam to the mine roof with the lifting means;

e. supporting the cross beam with beam jacks wherein the lifting means is lowered and the temporary roof support is advanced;

f. advancing the mining apparatus to the advanced mine face; and

g. repeating steps a, b, c, d, e and f.

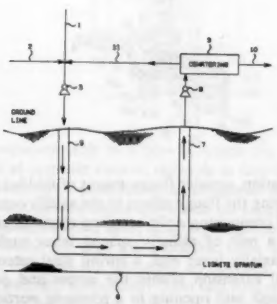
4,328,995
PRODUCTION OF LIGNITE FROM UNDERGROUND DEPOSITS

Roger W. Fenstermaker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 25, 1980, Ser. No. 143,669

Int. Cl.³ E21C 41/02

U.S. Cl. 299—17 4 Claims



1. A method for recovering lignite from an underground

formation which comprises passing a production fluid into and through said formation to form a recoverable suspension of lignite; wherein said production fluid contains a phosphate dispersing agent and wherein the concentration of said phosphate dispersing agent, based upon total weight of said production fluid, is less than 2.0 weight percent and greater than about 0.05 weight percent.

4,328,996

CUTTER DRUM SUPPORT ARM FOR LONGWALL MINING MACHINE

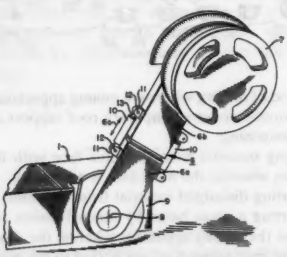
Dieter Jahn, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,441

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927919

Int. Cl.³ E21C *27/24*

U.S. Cl. 299—43 10 Claims



1. In a longwall mining machine adapted to traverse a face conveyor extending along a mine face of a mineral seam, a support arm pivotally mounted at its inner end to the mining machine about an axis extending perpendicular to the length of the arm and perpendicular to the direction of movement of the mining machine in cutting a seam, a cutter drum carried at the outer end of the arm for rotation about an axis extending parallel to said first-mentioned axis, and means for adjusting the length of said arm.

4,328,997

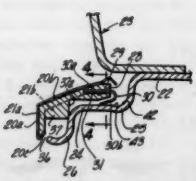
VEHICLE WHEEL TRIM

James Connell, 5017 Dianna Dr., Bloomfield Hills, Mich. 48013

Filed Oct. 17, 1979, Ser. No. 86,004

Int. Cl.³ B60B *7/06*

U.S. Cl. 301—37 P 5 Claims



3. In combination, annular flange means of molded material, means for securing the flange means to the axially outer face of a vehicle wheel comprising a clip-securing recess in said flange means having a pair of radially spaced inner surfaces and opening at its axially inner end, a spring steel retention clip having an axial extension within the recess and projecting therefrom through said opening to a retaining portion of the clip adapted to engage a vehicle wheel for attachment therewith, and means for securing the extension within the recess comprising an integral tab of said extension, the tab having a resilient connection with the extension and extending angularly therefrom to a sharp edge resiliently engaging one of said inner surfaces of the recess with sufficient force to embed thereinto and to urge the extension against the inner surface of the recess opposite said one surface engaged by the tab, the tab being resiliently yieldable to facilitate the initial insertion of the axial extension into the recess, said one inner surface of the recess having an offset portion defining a shoulder of said molded material aligned with the tab and arranged so that a portion of the sharp edge of the tab overlies and is spaced from the offset portion by said shoulder and another portion of said sharp edge embeds into said material of said one inner surface at said shoulder.

4,328,998

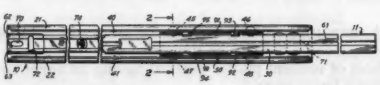
SLIDE BRACKETS

Morris Manson, Great Neck, N.Y., assignor to Corax Corporation, Yonkers, N.Y.

Filed Sep. 26, 1980, Ser. No. 191,164

Int. Cl.³ F16C *21/00*; A47B *88/00*

U.S. Cl. 308—3.8 17 Claims



1. A slide comprising first and second elongated members adapted for relative longitudinal sliding movement, said members including respective side walls cooperatively shaped to define longitudinal ball bearing tracks, ball bearings mounted in said tracks for facilitating the relative longitudinal sliding movement of said members, said tracks extending along said first and second members, a carrier for said ball bearings disposed between said members for relative longitudinal movement and stop means on one of said members to engage said carrier to limit movement thereof between end positions respectively corresponding to retracted and extended positions of the sliding members, said carrier including spring means for yieldably engaging one of said members for clasping the carrier thereto.

4,328,999

LINEAR MOTION ROLLING BEARING

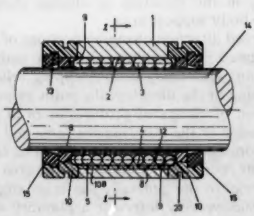
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt, and Horst M. Ernst, Eltingshausen, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,653

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909508

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C 4 Claims



1. In a linear motion rolling bearing including (a) an outer sleeve provided in its bore with axial races for the rolling

elements under load and return passages for the elements not under load, (b) a cage situated in said bore and defining with said sleeve a plurality of circumferentially distributed channels consisting of axial races for the rolling elements under load and not under load and semicircular turnarounds connecting said races to each other in pairs, (c) endless rows of rolling elements arranged in said channels, and (d) an end ring fixed to each end of the outer sleeve to close off the cage at said ends, the improvement wherein said end rings comprise axially spaced annular elements from material molded or cast onto said outer sleeve together with at least one axial element extending along said outer sleeve and between and connecting said annular elements, said end rings and outer sleeve being a unitary structure.

4,329,000
SELF-CONTAINED, DAMPED BALL BEARING ASSEMBLY

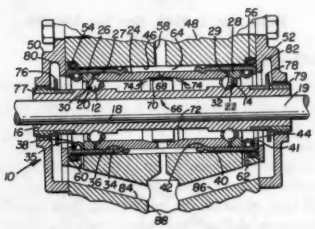
Frank E. Keske, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/01115, § 371 Date Aug. 28, 1980, § 102(e) Date Aug. 28, 1980, PCT Pub. No. WO82/00865, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 28, 1980, Ser. No. 261,092

Int. Cl.³ F16C *19/08*

U.S. Cl. 308—187 **20 Claims**



1. A self-contained bearing assembly (10) comprising:

an inboard outer race (24) having first and second ends (27,29);

first and second outboard outer races (26,28);

first and second sets of rolling elements (12,24);

inner race means (16) for rollingly supporting said first and second sets of rolling elements (12,14);

first retainer means (34,38) for resiliently biasing said first outboard outer race (26) toward said first end (27) of said inboard outer race (24) with said first set of rolling elements (12) therebetween, said first retainer means (34,38) being connected to said inboard outer race (24); and

second retainer means (40,44) for resiliently biasing said second outboard outer race (28) toward said second end (29) of said inboard outer race (24) with said second set of rolling elements (14) therebetween, said second retainer means (40,44) being connected to said inboard outer race (24).

4,329,001
DISPENSER FOR FOLDED SHEETS OF FLEXIBLE MATERIAL

Edwin A. Filipowicz, Greenfield; Robert W. Cornell, Hales Corners, and Scott J. Collins, Brown Deer, all of Wis., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Feb. 5, 1980, Ser. No. 118,771

Int. Cl.³ B65H *1/08*; A47B *63/00*

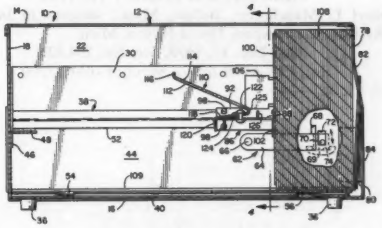
U.S. Cl. 312—71 **12 Claims**

1. A dispenser for folded sheets of flexible material comprising:

a cabinet having a front with an opening therein, a pair of opposed sidewalls and a pair of guides respectively affixed to the inner surfaces of said cabinet sidewalls, said guides having a channel-shaped cross-section with divergent sides;

a drawer for holding a supply of said sheets having a pair of ribs respectively formed along opposite sides thereof, said ribs having a channel-shaped cross-section with divergent sides which is similar to the cross-section of said guides, said rib sides respectively interfitting with and slidably engaging said guide sides to center and movably support said drawer in said cabinet and prevent any substantial lateral or vertical movement of said drawer relative to said cabinet;

a carriage assembly for engaging the rear of said sheet supply and including a pair or slides respectively affixed to opposite sides thereof, said slides having a channel-shaped cross-section with divergent sides which is similar to the cross-sections of said ribs and said guides, said slide sides respectively interfitting with and slidably engaging said rib sides to center and movably support said carriage assembly in said drawer and prevent any substantial lateral or vertical movement of said carriage assembly relative to said drawer; and



means associated with said cabinet for urging said carriage assembly forwardly of said drawer to thereby urge said sheets forwardly of said drawer and facilitate removal of said sheets individually through said cabinet front opening.

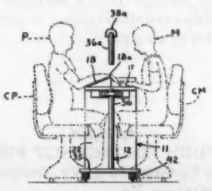
4,329,002
MANICURE TABLE

Theodore A. Cowen, Belvidere, and Gary B. Jackovin, Roscoe, both of Ill., assignors to Belvedere Company, Inc., Rockford, Ill.

Filed Aug. 4, 1980, Ser. No. 175,063

Int. Cl.³ A45D *29/00*; A47B *41/00*

U.S. Cl. 312—196 **6 Claims**



1. A manicure table of a type in which the manicurist and patron sit at opposite sides of the table in face-to-face relation, the manicure table comprising, an elongated table top having first and second side edges and means for supporting the table top at locations spaced apart along its length to provide a knee opening below the table top accessible from both sides of the table top, the table top including an operator top portion extending generally horizontally from said first side edge toward the center of the table top, said table top including an inclined

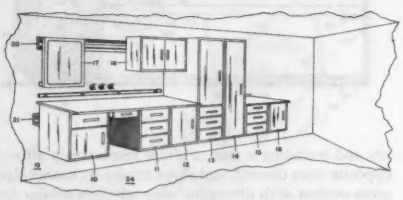
padded patron top portion extending from said second side edge toward the center of the table top and inclined upwardly at an acute angle to the horizontal for supporting the forearm of the patron in an upwardly inclined position and having its upper edge spaced above the operator top portion a distance sufficient to allow the patron's hand to flex at the wrist in a relaxed condition and extend downwardly from the upper edge of the inclined patron top portion toward said operator top portion.

4,329,003

CABINET-SUSPENSION SYSTEM

Robert L. Manchester, Bellair, Mich., assignor to Interflow Systems Corporation, Grand Haven, Mich.

Filed Dec. 17, 1979, Ser. No. 104,436
Int. Cl.³ A47B *67/02, 96/06;* F16M *13/00*
U.S. Cl. 312—245 **1 Claim**



1. In combination with a cabinet unit and a wall structure, a mounting means system having identical rail members for supporting said cabinet unit comprising:

an elongated rail at least the width of said cabinet secured to said wall structure, said rail having a cross-sectional configuration including a planar back portion, a first upwardly-turned hook portion spaced from the edge of said back portion and extending from said back portion, a second upwardly-turned hook portion, said second hook portion spaced downward from said first hook portion and extending from said back portion;

a short rail which is less than the width of said cabinet of identical cross section to that of said elongated rail, said short rail being secured to the upper back portion of said cabinet unit in inverted position with respect to said elongated rail, whereby said hook portions are interengageable in a direction perpendicular to said back portion; and

a bearing abutment interposed between, and secured to one of, the lower back portion of said cabinet unit and said wall structure to maintain vertical alignment of said cabinet unit and wall structure.

4,329,004

GAS FILLED HIGH VOLTAGE SLIP RING ASSEMBLY

Norris E. Lewis, Christiansburg, Va., assignor to Litton Systems, Inc., Blacksburg, Va.

Filed May 12, 1980, Ser. No. 148,713
Int. Cl.³ H01R *39/00*
U.S. Cl. 339—5 M **2 Claims**

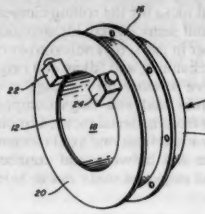
1. A high voltage slip ring assembly comprising:

a rotor and a stator for defining a cavity therebetween

an insulating gas having a dielectric strength substantially greater than the dielectric strength of air filling said cavity,

seal means operatively sealing said cavity for retaining said gas therein,

at least one electrical coupling means within said cavity for coupling power from the stator to the rotor,



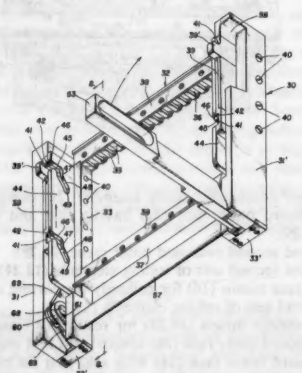
whereby operational short circuiting and arcing within said cavity is prevented.

4,329,005

SLIDE CAM MECHANISM FOR POSITIONING TEST ADAPTER IN OPERATIVE RELATIONSHIP WITH A RECEIVER

Paul A. Braginetz, 214 Oak Ridge Cir., Staunton, Va. 24401; Quentin E. Cline, P.O. Box 501, 221 Eleventh St., Grottoes, Va. 24441, and Paul D. Floyd, P.O. Box B, Lyndhurst, Va. 22952

Filed Apr. 1, 1980, Ser. No. 136,289
Int. Cl.³ H01R *25/00*
U.S. Cl. 339—18 B **8 Claims**



1. A mechanism for positioning a test adapter in operative relationship with a receiver comprising a receiver body, fixed hanger plates on opposite sides of the receiver body having spaced straight guide slots which are parallel and whose axes are normal to an electrical contact plane of the receiver, reciprocating slide plates on opposite sides of the receiver body extending adjacent to the fixed hanger plates and having spaced profiled cam slots including entrance portions parallel to said straight slots and adapted in one position of the slide plates to register with entrance portions of the straight slots, manually operable means on the receiver body to reciprocate said slide plates in unison relative to the fixed hanger plates between test adapter release and locking positions, a test adapter including side members and pairs of spaced projecting locator elements on the side members adapted for precision engagement within said straight slots of the fixed hanger plates and said cam slots of the reciprocating slide plates, and said projecting locator elements each comprising a pair of side-by-side independent rollers adapted to engage respectively within a straight slot of a fixed hanger plate and a cam slot of a slide

plate, said rollers being capable of reverse rotation during the camming action induced by reciprocation of said slide plates.

4,329,006

ELECTRICAL FUSE HOLDERS

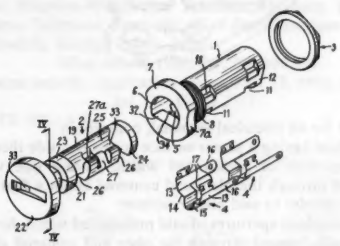
James A. S. Gale, Warminster, England, assignor to Kenneth E. Beswick Limited, Somerset, England

Filed Feb. 1, 1980, Ser. No. 117,636

Claims priority, application United Kingdom, Feb. 6, 1979, 7904184

Int. Cl.³ H01R *13/68*; H02B *1/04*

U.S. Cl. 339—126 R **7 Claims**



1. In a fuse holder for a cartridge fuselink, including a hollow insulating body having a substantially cylindrical internal chamber disposed between opposite ends of said body and having its axis intersecting said ends, and an insulating fuse carrier slidable axially within said chamber through an opening in one of said ends of said body and turnable, when fully inserted therein to lock said carrier in said body, said fuse carrier having a receptacle for a cartridge fuselink arranged so as to engage end cap terminals of said fuselink with electrical contacts means mounted on the body when the carrier is turned to lock said carrier in said body;

the improvement which permits said fuse carrier to be completely separable from said body, whilst restricting access to said internal chamber, and prohibits engagement of said fuselink with said contact means until said fuse carrier is fully inserted into said chamber, and which comprises in combination:

(a) chord-like shoulder means at said one end of said body defining a segmental-shaped opening providing access to said chamber substantially conforming to a part of the cross-section of said cylindrical chamber,

(b) said fuse carrier having an external configuration adapted to permit at least a part of said carrier to be inserted into said body chamber through said segmental opening when said carrier is oriented in a predetermined position relative to said body,

(c) means on said fuse carrier part defining a receptacle for said cartridge fuselink, said receptacle being arranged to mount said fuselink with its axis eccentrically disposed with respect to said axis of said cylindrical internal body chamber,

(d) means on said fuse carrier engagable behind said chord-like shoulder means when said carrier part is inserted into said body chamber, through said segmental opening, and said carrier is turned, whereby to lock said carrier in said body, and

(e) insulating barrier portions associated with said fuselink receptacle of said carrier and arranged to be disposed between said end caps of said fuselink and said contact means as said fuse carrier is inserted into said internal body chamber.

4,329,007

MOUNTING OF FILAMENT ASSEMBLIES IN LAMP UNITS

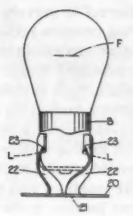
Brian P. G. Irons, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 3, 1980, Ser. No. 136,864

Claims priority, application United Kingdom, Apr. 28, 1979, 7914841

Int. Cl.³ H01R *33/46*

U.S. Cl. 339—188 R **6 Claims**



1. A mounting member adapted to support a filament assembly having a base and a pair of laterally projecting mounting lugs on said base, said mounting member being made of a deformable material and comprising a generally flat base portion having an aperture therein and a pair of projections which are integral with said base portion and which are deformed from first positions to second positions, said projections in said first positions being generally co-planar with said base portion and extending into the aperture thereof, and being spaced apart transversely of their direction of extent and overlapping one another in said direction, and in said second positions being upstanding from said base portion, said projections being provided with lug-reception means adapted to receive said mounting lugs of said filament assembly, said lug-reception means being spaced from said base portion when said projections are in said second positions.

4,329,008

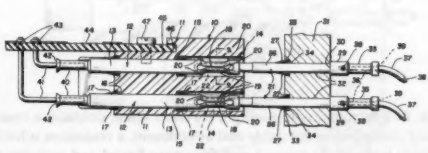
HIGH DENSITY CONNECTOR MODULE WITH TRI-PADDLE CONTACT ELEMENTS

Paul A. Braginetz, 214 Oak Ridge Cir., Staunton, Va. 24401

Filed Apr. 1, 1980, Ser. No. 136,288

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—217 S **1 Claim**



1. A high density electrical connector structure particularly for computer interface equipment and the like, said connector structure comprising an individual test adapter panel, said panel having plural parallel rows of through openings, the through openings of adjacent rows being staggered to provide a higher density of connections through the panel, a multiplicity of male sessile conductors anchored within said through openings and having rear ends thereof projecting beyond one face of said panel and adapted for connection with sessile cables, the sessile conductors having male contact pins at their other corresponding ends extending forwardly of the other face of said panel, and a coacting receiver comprising at least one elongated bar-like high density conductor module having in one face thereof plural parallel longitudinal rows of recesses with the recesses in each row staggered relative to those of

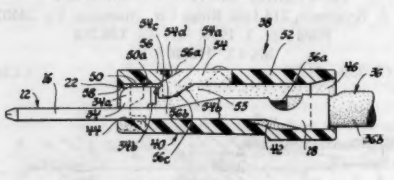
adjacent rows so as to correspond in spacing to the through openings of said panel and the spacing of said male contact pins, the high density conductor module having passages of reduced cross sectional size extending from the bottoms of said recesses through the other face of said module remote from said panel, a corresponding number of tri-paddle tubular spring contacts in said recesses and passages extending from said recesses and projecting forwardly of said other face of the high density connector module, axially spaced oppositely acting spring clips on the tri-paddle tubular spring contacts lockingly engaged with the bottoms of the recesses and with said module near said other face thereof to prevent axial movement of the tri-paddle tubular spring contacts relative to said module, the tri-paddles of such contacts receiving snugly said male contact pins of the sessile conductors within said recesses of high density conductor module, such module being provided on its top face with a flat locator surface for a printed circuit board and being further provided with a locator groove for said board at the rear of the locator surface and near the front-to-back center of the module, said locator surface and groove extending for the entire length of said module and the locator surface being in a plane parallel to the axes of said tri-paddle tubular spring contacts and said groove extending across such axes, a printed circuit board having printed circuit elements on its top face seated on said locator surface and having one edge portion engaged in said locator groove, screws anchoring printed circuit boards firmly to the locator surface with said boards projecting substantially forwardly of said module in overhanging relationship to the front face thereof, and substantially L-shaped wire-wrapped posts electrically interconnecting said printed circuit elements with forward terminals of the tri-paddle tubular spring contacts beneath said printed circuit board and forwardly of said module.

4,329,009

ELECTRICAL CONNECTOR

Edward M. Bungo, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 72,039, Sep. 4, 1979, Pat. No. 4,253,718. This application Sep. 2, 1980, Ser. No. 183,016
Int. Cl.³ H01R *11/18*
U.S. Cl. 339—223 R **1 Claim**



1. In a terminal comprising a forward blade contact, a rearward crimp barrel for cable end attachment, a transition which connects the blade contact and the crimp barrel and includes a side flap folded over onto a planar portion thereof, and a projection connected to the terminal by the side flap, the improvement comprising:

said transition having a pair of side flaps connected to opposite longitudinal side edges of the planar portion of the transition and folded thereover to provide confronting longitudinal edges,

said projection being relatively rigid and comprising two L-shaped sections arranged back-to-back in a T-shaped configuration which is disposed substantially normal to the blade contact and planar portion of the transition,

said L-shaped sections having first legs integrally attached to the confronting longitudinal edges of the respective side flaps, and

said L-shaped sections having second legs which are supported by the respective first legs and which are aligned transversely of the blade contact, and

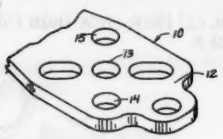
said side flaps forming gussets rearwardly of the projections which are faired into the crimp barrel.

4,329,010

ELECTRICAL TERMINAL CONNECTOR

Robert A. Balch, 2616 SW. Stanley Ct., Portland, Oreg. 97219

Filed Nov. 13, 1979, Ser. No. 93,842
Int. Cl.³ H01R *4/46*
U.S. Cl. 339—265 R **6 Claims**



1. A pad for en electrical terminal, comprising:

a rigid plate having a planar surface across one side thereof;

a first aperture of preselected width, having side walls formed through the plate and centered about a first axis perpendicular to said planar surface;

second and third apertures of said preselected width, having side walls formed through the plate and centered about second and third axes parallel to and equally spaced to opposite sides of said first axis along a first straight plane containing said first axis;

first and second elongated apertures formed through the plate, each having an inner end wall and an outer end wall tangentially joined by connecting side walls, the inner and outer end walls being respectively centered about inner and outer axes parallel to and equally spaced to opposite sides of said first axis along a second straight plane containing said first axis and perpendicular to said first straight plane;

said second and third axes and said outer axes being located at the corners of a first square centered about said first axis and having sides of first preselected length;

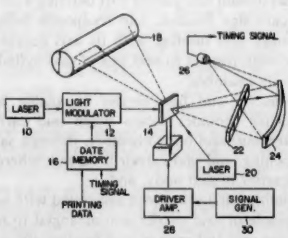
said inner axes of the elongated apertures being spaced from one another within said second straight plane by a distance equal to said first preselected length.

4,329,011

METHOD FOR DRIVING A LIGHT SCANNING APPARATUS

Masafumi Mori, Mountain View, Calif., and Tutomu Saito, Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 19, 1979, Ser. No. 95,502
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.6 **12 Claims**



1. A method for driving a light scanning apparatus which

scans an object with light in accordance with voltage signals supplied to drive means, said method comprising:

a first step of supplying a voltage signal of a first predetermined level to said drive means;

a second step of supplying a voltage signal of a second predetermined level to said drive means;

a third step of supplying a voltage signal of a third predetermined level to said drive means; and

a fourth step of supplying a voltage signal of a fourth predetermined level to said drive means,

said first to fourth steps being repeated in this order, said first level being between said second and third levels, and said fourth level being between said first and second levels.

4,329,012

TWO-DIMENSIONAL SCANNING DEVICE

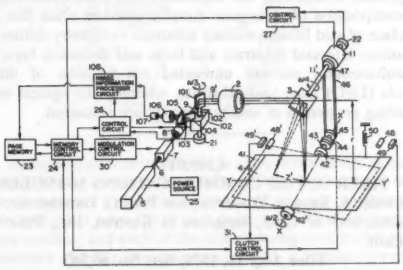
Kazuo Minoura, Yokohama; Takehiko Kiyohara, Zama, and Haruo Uchiyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 8, 1980, Ser. No. 110,378

Claims priority, application Japan, Jan. 17, 1979, 54-3036

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.8 **6 Claims**



1. A two-dimensional scanning device, comprising:

(a) first deflecting means to perform the principal scanning on the surface to be scanned;

(b) second deflecting means to deflect a light beam within a plane which orthogonally intersects with a deflecting plane of the light beam to be deflected by said first deflecting means, and to perform the auxiliary scanning in the direction orthogonally intersecting the direction of said principal scanning on the scanning surface;

(c) an image forming optical system interposed between said first and second deflecting means; and

(d) mechanical means to rotate said scanning surface around a rotational axis extending in the direction orthogonally intersecting the scanning line by the operation of said second deflecting means on said scanning surface and to rotate said scanning surface in accordance with the deflecting action of said second deflecting means so that one of the focal positions of said image forming optical system is constantly present on the scanning surface.

4,329,013

BINOCULAR TELESCOPE WITH INTERNAL FOCUSING

Alfred Hengst, Wetzlar-Dorlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed May 20, 1980, Ser. No. 151,657

Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920583

Int. Cl.³ G02B *7/06, 7/12, 23/00*

U.S. Cl. 350—36 **9 Claims**

1. A binocular telescope with internal focusing, comprising:

two telescope tubes, each having an ocular end and an objective end;

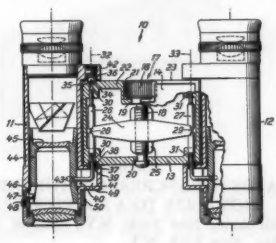
an ocular lens axially fixed within the ocular end of each of said telescope tubes;

an objective lens axially fixed within the objective end of each of said telescope tubes;

a double joint bridge connecting said two telescope tubes;

a central focusing element rotatably connected to said bridge;

means, located in at least a first of said telescope tubes and including a first focusing lens axially movable within said



first tube between said ocular and objective lenses, for internally focusing said telescope;

means for transforming rotational movement of said central focusing element into axial adjustment of said focusing lens; and

means, including an annular bushing rotatably mounted near the objective end of said first telescope tube on the outside surface of and coaxially with said first tube, for independently varying the axial position of said first focusing lens, in order to make diopter focusing adjustments.

4,329,014

INCIDENT LIGHT ILLUMINATION INSTRUMENT FOR SELECTIVE LIGHT AND DARK FIELD ILLUMINATION

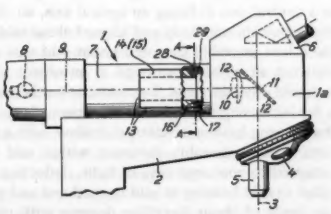
Günter Reinheimer, Biebertal, and Norbert Gaul, Solms-Oberbiel, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 13, 1980, Ser. No. 159,192

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 7917232[9]

Int. Cl.³ G02B *21/10*; B02B *7/00*

U.S. Cl. 350—89 **10 Claims**



1. An incident light illumination apparatus having a housing and a light source for generating dark and light field illumination along an optical axis through said housing comprising:

(a) optical deflecting means (11) located along said optical axis;

(b) said housing including an illumination stub (7) located between said light source (8) and said optical deflecting means (11) along said optical axis;

(c) an aperture (13) passing transversely through said illumination stub (7);

(d) an insertion module (14) having at least first (I) and

second (II) functional groups adapted for interchangeable insertion into said aperture;

(e) said first functional group containing light bounding optical elements (19,20) and said second functional group containing at least one light bounding optical element (27); and

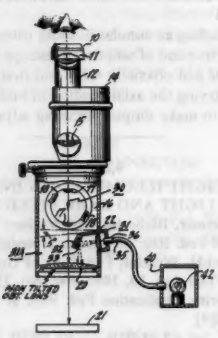
(f) a center stop (30) and means (28,29) connecting said second functional group and said center stop for pivoting said center stop into said optical axis.

4,329,015

APPARATUS FOR INCREASING THE INPUT LIGHT INTENSITY TO A MICROSCOPE

Richard Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Division of Ser. No. 945,122, Sep. 25, 1978, Pat. No. 4,251,128, which is a continuation of Ser. No. 851,935, Nov. 16, 1977, abandoned. This application Aug. 14, 1980, Ser. No. 178,157
Int. Cl.³ G02B 21/12
U.S. Cl. 350—91 5 Claims



1. In a microscope including a microscope body disposed about a central axis defining an optical axis, an objective lens positioned within said body and aligned about said axis, and an eyepiece lens assembly disposed about said axis and adapted for viewing an object positioned at an object plane located beneath said objective lens, the combination therewith of apparatus for increasing the light at said object plane, comprising:

(a) a housing having an internal hollow with a first opened end, a lens assembly mounted within said hollow and adapted to converge rays of light, deflecting means coupled to said housing at said opened end and positioned at an angle of about forty-five degrees with respect to the main axis of said housing, means coupled to said housing for introducing light rays, which rays are converged by said lens and deflected downward by said deflecting means,

(b) means coupling said housing to said microscope body for positioning said housing at a small angle of about 5 degrees from a line perpendicular to said optical axis, to cause said downward deflected rays to be directed through said objective lens and because of said small angle, to prevent spurious light rays from appearing at said eyepiece lens assembly with distortion at said eyepiece lens assembly.

4,329,016

OPTICAL WAVEGUIDE FORMED BY DIFFUSING METAL INTO SUBSTRATE

Bor-Uei Chen, Northridge, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 911,543, Jun. 1, 1978, Pat. No. 4,206,251. This application Sep. 24, 1979, Ser. No. 78,106
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.12 1 Claim

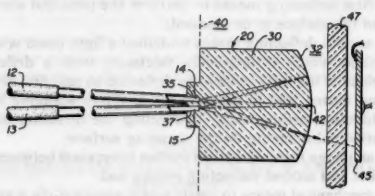
1. An optical waveguide structure wherein a lithium niobate ($LiNbO_3$) substrate has a titanium-diffused waveguiding layer therein atop which is disposed a dielectric layer comprising a composite film of titanium oxide and silicon dioxide, formed by a process comprising the deposition and subsequent thermal decomposition of an organo-metallic titanium-silica film on a surface of said lithium niobate substrate to thereby diffuse said titanium into said substrate and form said dielectric layer and simultaneously prevent unwanted out-diffusion of lithium oxide (Li_2O) from said substrate, whereby the optical waveguiding properties of said waveguide are enhanced.

4,329,017

FIBER OPTICS COMMUNICATIONS MODULES

Narinder S. Kapany, Woodside, and Fred C. Unterleitner, Palo Alto, both of Calif., assignors to Kaptron, Inc., Palo Alto, Calif.

Filed Aug. 14, 1979, Ser. No. 66,367
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.15 20 Claims



1. A device for coupling the output from a source of light to an end of an optical fiber comprising:

a body of optically transparent material having an index of refraction substantially equal to the index of refraction of said fiber, said body having a portion defining a spherical reflective surface characterized by a focal plane having the property that a point source of light in said focal plane is imaged in said focal plane, said reflective surface being characterized by a coefficient of reflection sufficiently less than unity to permit a detectable fraction of light incident on said reflective surface to pass therethrough;

first position defining means for registering said source of light to a first location within said focal plane;

second position defining means for registering an end of said fiber to a second location within said focal plane and separated from said first location, said first and second locations being on opposite sides of a radial axis, being displaced equal amounts from said radial axis such that the center of curvature of said spherical reflective surface lies on the straight line between said first and second loca-

tions, whereby said second location is optically complementary to said first location so that said light source, when positioned at said first location, is imaged on said end of said fiber at said second location; and

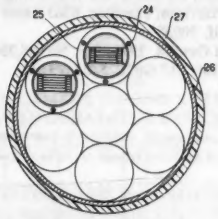
a photodetector on the side of said reflective surface remote from said focal plane for providing a signal representative of the intensity of said light source when said light source is positioned at said first location.

4,329,018

OPTICAL TELECOMMUNICATIONS CABLE

René Dubost, La Tour du Pin, France, assignor to Societe Anonyme dite: Les Cables de Lyon, Clichy, France

Filed Dec. 15, 1977, Ser. No. 860,974
Claims priority, application France, Dec. 21, 1976, 76 38457
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.23 **7 Claims**



1. An optical telecommunications cable comprising: an outer tube of circular cross-section made of aluminum covered with a plastic material; a plurality of strands of circular cross-section inside said outer tube, the strands being assembled tangentially to one another; and each of the strands being constituted by an elementary circular structure covered by a tubular covering made of plastic material and reinforced by a plurality of strength members disposed in said covering, said elementary circular structure comprising a substantially rectangular matrix structure, surrounded with compressible cellular filler tapes made circular by being bound in a paper or plastic binding tape wound helically thereabout, said matrix structure being constituted by a plurality of tape components with ridges and troughs stacked and fastened to each other and including hexagonal cells containing respective optical conductors, each of the tape components being composed of two juxtaposed thin aluminum tapes with transversely spaced, longitudinally extending troughs, whose opposite surfaces are coated with polyethylene and welded longitudinally by heat softening of said polyethylene.

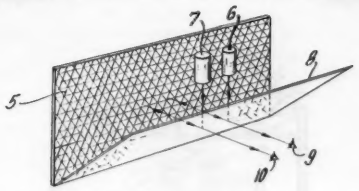
4,329,019

THREE-DIMENSIONAL IMAGE DISPLAY APPARATUS AND A SCREEN THEREFOR

Takanori Okoshi, 7-7, 3-chome, Sengoku, Bunkyo-ku, Tokyo, Japan, and Makoto Okoshi, deceased, late of Tokyo, Japan (by Takanori Okoshi, legal representative), assignors to Takanori Okoshi, Tokyo, Japan

Continuation-in-part of Ser. No. 42,614, May 25, 1979, abandoned, which is a continuation of Ser. No. 884,845, Mar. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 372,001, Jun. 21, 1973, abandoned, which is a continuation of Ser. No. 808,223, Mar. 18, 1969, abandoned. This application Jan. 15, 1980, Ser. No. 112,191
Claims priority, application Japan, Mar. 21, 1968, 43-18482
Int. Cl.³ G03B 21/60
U.S. Cl. 350—129 **6 Claims**

1. A device for producing a three-dimensional picture image, comprising a reflection-type three-dimensional image display screen having plural reflectors arranged to form an image display surface, each reflector including three reflecting faces arranged to intersect at a common point, two of said faces being flat and intersecting at right angles in a line perpendicular to the parallax direction, the other face of each reflector being parallel to the parallax direction and being cylindrical with respect to an axis parallel to said parallax direction, the curvatures of all the cylindrical reflecting faces being equal in absolute value to one another, means for projecting the three-



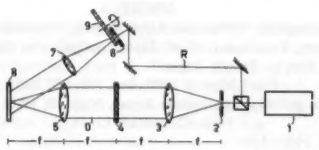
dimensional image recorded on a recording body; a light-shielding arrangement in the plane of the recording body and having an aperture through which light projected from the projecting means passes, said arrangement having a size in a direction perpendicular to the parallax direction large enough to remove light expanding from the screen in the parallax direction.

4,329,020

METHOD OF MANUFACTURING INVERSE FILTERS BY HOLOGRAPHIC TECHNIQUES

William J. Dallas, Hamburg; Rolf Linde, Haseldorf, and Hermann Weiss, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1980, Ser. No. 116,692
Int. Cl.³ G02B 5/32
U.S. Cl. 350—162 SF **7 Claims**



1. In a method for manufacturing inverse filters by holographic techniques wherein a plate provided with photographic material having a response such that its transmittance versus illumination characteristics define a curve having linear and logarithmic portions is illuminated by a reference wave and an object wave emanating from an object illuminated by a light beam, the improvement wherein a single photographic plate provided with said photographic material is illuminated with the reference and object waves so as to expose said material in the logarithmic portion of the response curve thereof to produce a holographic image which upon development forms the inverse filter.

4,329,021

PASSIVE SOLAR LIGHTING SYSTEM

David J. Bennett, Minneapolis, and David A. Eijadi, St. Paul, both of Minn., assignors to Bather, Ringrose, Wolsfeld, Jarvis, Gardner, Inc., Minneapolis, Minn.

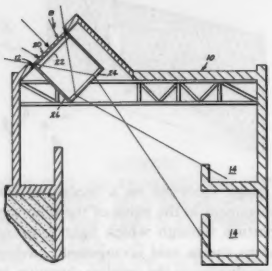
Filed Apr. 16, 1980, Ser. No. 140,853
Int. Cl.³ G02B 17/00, 27/00
U.S. Cl. 350—259 **9 Claims**

1. A passive solar lighting system for use in lighting the

interior of a building having a light aperture comprising in combination:

(a) passive means adapted to be located at a fixed location adjacent an aperture through a building for increasing the angle of light acceptance through which sunlight may enter the aperture;

(b) focusing means located in line with said passive increasing means for receiving light transmitted by said passive



increasing means and further transmitting and directing said light to a desired target area within the building; and

(c) means for holding said focusing means optically in line with said passive increasing means to receive light therefrom, said holding means including a frame having sidewalls substantially orthoginal to said focusing and passive means, said sidewalls being reflective so that an increased amount of light will pass through said focusing means.

4,329,022

TWO GROUP TYPE ZOOM LENS WITH WIDE IMAGE ANGLE

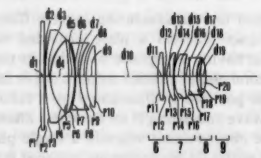
Shin Yamaguchi, Hiratsuka; Akira Tajima, Kawasaki, and Keiji Ikemori, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1980, Ser. No. 147,298

Claims priority, application Japan, May 10, 1979, 54-57480

Int. Cl.³ G02B *15/14*

U.S. Cl. 350—426 **4 Claims**



1. A two-group type wide-image-angle zoom lens for zooming by changing the distance between the front and the rear group, comprising:

a front group having a negative refracting power and including a first positive lens, a second negative lens concave toward the image end, a third positive lens, a fourth negative lens concave toward the image end and a fifth positive lens convex toward the object end in sequence; and

a rear group arranged closer to the image end than the front group, having a positive refracting power and including a first positive sub-group, a second positive sub-group, a third negative sub-group, and a fourth positive sub-group, said lenses and sub-groups exhibiting the relations

$$f1 \geqq 1.2\,f3$$

$$0.06 \leqq \frac{r6 - r7}{r6 \cdot r7} \cdot fT \leqq 0.39$$

wherein:

fT is the focal length of the whole system at the end of the telephoto side

f1 is the focal length of the first positive lens

f3 is the focal length of the third positive lens

r6 is the radius of curvature at the rear surface of the third positive lens

r7 is the radius of curvature at the front surface of the fourth negative lens.

4,329,023

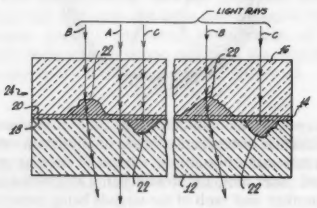
DIFFUSION FILTER AND METHOD OF MAKING SAME

William H. Harrison, deceased, late of Los Angeles, Calif., and by Hartley K. Harrison, executor, 6363 Santa Monica Blvd., Hollywood, Calif. 90038

Filed Oct. 18, 1979, Ser. No. 86,250

Int. Cl.³ G02B *5/02, 13/20*

U.S. Cl. 350—431 **22 Claims**



1. A diffusion filter for use in combination with an image-forming lens by placement inside the front nodal point of said lens to produce a composite image having a simulated three-dimensional effect while minimizing halation and veiling, said filter comprising:

a light transmissive plate to be arranged so that a surface thereof is intersected by the axis of said image-forming lens, said plate having an array of spaced-apart pits on said surface separated by smooth flat surface areas, said pits being so dimensioned that the majority of the light falling on said plate passes through said surface areas without striking said pits; and

a light transmissive material that is substantially more absorptive of light than said plate, having an index of refraction different than that of said plate and filling said pits, whereby light collected by said lens that has not entered any of said pits forms a first image that is sharply defined, some light collected by said lens that has entered said pits and has been refracted forms a second superimposed image that is softly defined, and some light that has entered said pits is absorbed by said material and is thus prevented from impinging upon said image as scattered or heterogenous light.

4,329,024

OBJECTIVE LENSES

Philip J. Rogers, Clwyd, Wales, assignor to Pilkington P.E. Limited, St. Helens, England

Filed Sep. 12, 1978, Ser. No. 944,607

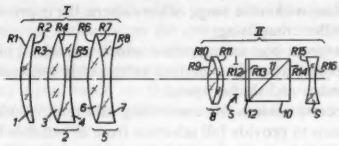
Claims priority, application United Kingdom, Sep. 13, 1977, 38194/77

Int. Cl.³ G02B *9/60*

U.S. Cl. 350—465 **16 Claims**

1. A modified Petzval lens system comprising a front lens

group and a rear lens group spaced from the front lens group, wherein the front lens group comprises at least two doublet components one of which consists of a crown positive element cemented to a flint negative element with the flint glass having significantly higher refractive index and dispersion values than



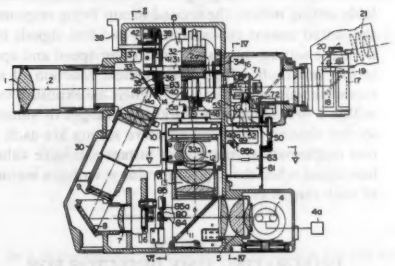
those of the crown glass, the other said doublet component consisting of a crown positive element and a flint negative element with the flint and crown glasses having similar refractive indices but dissimilar dispersions, the flint glass having a positive red relative partial dispersion deviant.

4,329,025

EYE FUNDUS CAMERA HAVING A FLUORESCENT PHOTOGRAPHING DEVICE

Shinichi Nishimura, and Yoshihiko Hanamura, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 117,941
Claims priority, application Japan, Feb. 9, 1979, 54/13906
Int. Cl.³ A61B *3/10, 3/14*
U.S. Cl. 351—7 **7 Claims**



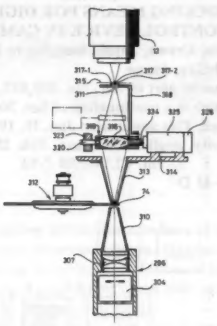
1. Eye fundus camera comprising objective lens means adapted to be placed so that it is opposed to a patient's eye, an illumination system including an illumination path for projecting an illumination light to the patient's eye through the objective lens means, an observing and photographing optical system including an imaging optical path for focusing the light as reflected at fundus of the patient's eye to produce an image of the eye fundus on an image plane, fluorescence exciting filter means provided in the illumination system so that it can be retractably inserted into the illumination path, fluorescence filter means provided in said photographing optical system so that it can be retractably inserted into the imaging optical path, means for increasing intensity of the illumination light when the fluorescence exciting filter means is inserted into the illumination path, data indicating means, data illuminating optical path for leading a portion of the light in the illumination system to the data indicating means, a data projecting optical system for directing the light as reflected at the data indicating means to the image plane in the photographing optical system, means for restricting at least a portion of the light to said data indicating means when at least one of the fluorescence exciting filter means and the fluorescent filter means is inserted into the illumination path.

4,329,026

PHOTOCOMPOSING MACHINE AND METHOD

Louis M. Moyroud, Delray Beach, Fla., assignor to Autologic, S.A., Bussigny-pres-Lausanne, Switzerland

Continuation-in-part of Ser. No. 889,001, Apr. 21, 1978, Pat. No. 4,230,399, and Ser. No. 92,465, Nov. 8, 1979. This application Oct. 17, 1980, Ser. No. 198,055
Int. Cl.³ B41B *13/00;* **G03B** *15/00, 17/06*
U.S. Cl. 354—5 **39 Claims**



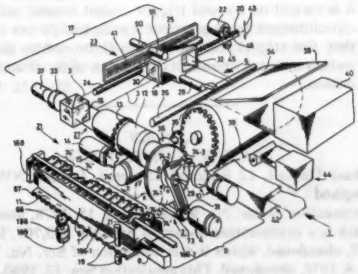
23. In or for a photocomposing machine including a movable character matrix and means for moving said matrix in order to facilitate the selection of characters to be projected onto a photo-sensitive surface, a character spacing mechanism for spacing characters from one another when projected onto said surface, means for moving said mechanism substantially continuously while composing a line of characters, deflecting means located between said matrix and said photo-sensitive surface for deflecting each character image to one side or the other, and means for controlling said deflecting means to properly locate said character image on said surface.

4,329,027

PHOTOCOMPOSING MACHINE AND METHOD

Louis M. Moyroud, Delray Beach, Fla.; Michel Bongard, Saint Sulpice, Switzerland; Paul A. Vernez, Chavannes, Switzerland, and Michel Moulin, Lausanne, Switzerland, assignors to Autologic, S.A., Bussigny-pres-Lausanne, Switzerland

Filed Oct. 17, 1980, Ser. No. 198,284
Int. Cl.³ B41B *13/00;* **G03B** *23/00, 15/00, 17/06*
U.S. Cl. 354—5 **47 Claims**



1. In or for a photocomposing machine including image presentation means for presenting images at a projection position, and image projection and location means for projecting said images from said position and locating said images in a predetermined order on a photosensitive record surface, said image presentation means including storage means for storing a plurality of image-bearing matrices, and selection means

responsive to coded signals for selecting one of said matrices and moving the matrix so selected from said storage means to said projection position for projection of images therefrom, each of said matrices bearing character images in a plurality of arrays, said selection means being adapted to move the selected matrix in order to select among said arrays, as well as to move said matrix from said storage means to said projection position.

4,329,028

MEMORY LOCKING MEANS FOR DIGITAL EXPOSURE CONTROL DEVICE IN CAMERAS

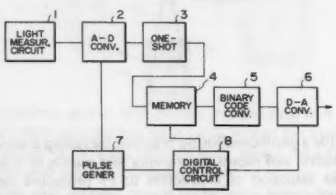
Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Continuation-in-part of Ser. No. 855,557, Nov. 29, 1977, abandoned, which is a continuation of Ser. No. 659,232, Feb. 19, 1976, abandoned. This application Jun. 19, 1979, Ser. No. 50,061

Claims priority, application Japan, Feb. 25, 1975, 50-23871

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—23 D **6 Claims**



1. In a digital exposure control device for a photographic camera including a shutter release button, a power switch of an exposure control circuit which is closed upon half depression of the shutter release button, a light measuring circuit for measuring the scene brightness, an A-D converter connected to said circuit for converting the output of the light measuring circuit to an output signal consisting of a series of pulses the number of which represents a digital value, a memory element connected to said converter for memorizing the output signal of the A-D converter, and a code converter for converting the output of the memory element to a value for controlling an exposure control means such as a shutter or a diaphragm,

a memory locking means comprising a one-shot circuit means connected between said A-D converter and said memory element for transmitting the output signal of the A-D converter to the memory element only while the output level of the one-shot circuit means is high, said memory locking means comprising trigger circuit means for turning said one-shot circuit means on and off, the output level of said one-shot circuit being high only when it is turned on by said trigger circuit means, said trigger circuit means being associated with said power switch so that the trigger circuit is turned on when the power switch is closed upon half depression of the shutter release button.

4,329,029

CAMERA CONTROLLER

Raphael Haskell, 12 Elmcroft Crescent, London NW11 9SY, England

Continuation of Ser. No. 960,865, Nov. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 863,707, Dec. 23, 1977, abandoned, which is a continuation of Ser. No. 729,954, Oct. 6, 1976, abandoned. This application Sep. 12, 1980, Ser. No. 186,762

Claims priority, application United Kingdom, Oct. 9, 1975, 41471/75; Japan, Oct. 8, 1976, 51/120439; Fed. Rep. of Germany, Oct. 8, 1976, 2645541

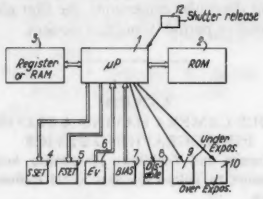
Int. Cl.³ G03B *7/097*

U.S. Cl. 354—23 D **30 Claims**

1. In a camera having adjustable lens aperture, adjustable shutter speed, controllable setting means for automatically setting the shutter speed and the lens aperture, and further including means providing a signal representing an instant exposure value required for proper exosure of the film therein, the lens aperture and the shutter speed being adjustable within respective f-number limits and shutter speed limits, said limits in combination defining overall minimum and maximum exposure values within the range of the camera, the improvement of a controller comprising:

operator-set bias setting means which provides a bias signal representative of a desired relationship between lens f-number and shutter speed;

a processor means for controlling said controllable setting means to provide full selection from all possible f-number and shutter speed combinations that define the instant exposure value, said processor means including:



first means for storing the instant exposure value signal and the bias signal; and

second means for producing a shutter speed setting signal and an aperture setting signal for controlling said controllable setting means, the second means being responsive to the stored instant exposure value and bias signals to produce the setting signals so that shutter speed and aperture setting are each a first mathematical function of instant exposure value and bias signal when the exposure value is within a first range of a plurality of ranges of values, and so that shutter speed and aperture setting are each a second mathematical function of instant exposure value and bias signal when the exposure value is within a second one of such ranges of values.

4,329,030

INTEGRATING TIME DETECTOR FOR PHOTOGRAPHIC APPARATUS

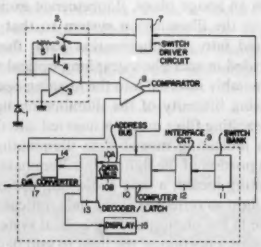
Mamoru Aihara; Yutaka Takahashi; Yoshio Nakajima, all of Hachioji, and Tsuyoshi Matsuura, Ina, all of Japan, assignors to Olympus Optical Company, Ltd., Japan

Filed Oct. 3, 1980, Ser. No. 193,839

Claims priority, application Japan, Oct. 5, 1979, 54-128009

Int. Cl.³ G03B *7/093*

U.S. Cl. 354—23 D **14 Claims**



1. An integrating time detector for a photographic apparatus, comprising:

integrating means for integrating an input signal to provide an integral signal;

means for producing a given reference signal for comparison with the integral signal until a given time interval is reached, and for producing a changing reference signal which changes as a given function of time after the given time interval if the integral signal does not reach the given reference value within the given time interval, thereby detecting a time when the integral signal coincides with the changing reference voltage, said means calculating an integrating time interval corresponding to the given reference signal based on the time when the coincidence is detected, the given reference signal and the given function of time; and

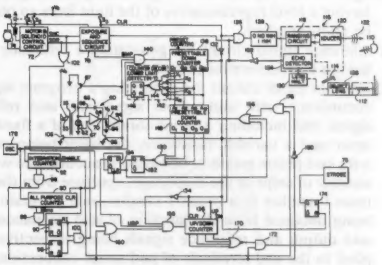
comparison means for comparing the integral signal outputted from the integrating means against the reference signal produced by the calculating means to output a coincidence signal whenever the integrating and reference signals coincide with each other.

4,329,031

PHOTOGRAPHIC SYSTEM FOR VARYING FLASH FIRE APERTURE AS A FUNCTION OF AMBIENT SCENE LIGHT

Peter P. Carcia, Reading; George D. Whiteside, Lexington, and Arthur N. Woodbury, Acton, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 2, 1981, Ser. No. 230,491
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—23 D **16 Claims**



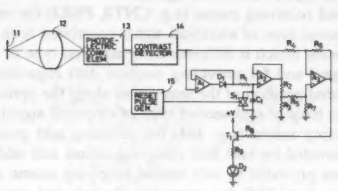
1. In a photographic exposure control system for use with a source of artificial illumination and for controlling the exposure of a photosensitive recording medium, said system having a shutter arrangement for at least initially providing progressively increasing aperture values at a predetermined rate during an exposure interval within which scene light is transmitted to the photosensitive medium following actuation of said shutter arrangement, means for providing a flash fire signal to ignite the source of artificial illumination during the exposure interval, and means for determining the distance of a photographic subject from said system to define a range related time interval corresponding to the subject distance and for producing said flash fire signal responsive to a lapse of a time period commencing at the initiation of the exposure interval and corresponding to said range related time interval to thereby produce said flash fire signal at an aperture value corresponding to the subject distance, the improvement comprising means for detecting ambient scene light prior to exposure, and means responsive to the pre-exposure detection of ambient scene light intensity above a first select level and below a second select level greater than said first select level for progressively varying said lapsed time period at which said flash fire signal is provided in inverse corresponding relation to the progressive variation of said detected ambient scene light between said first and second levels for a determined subject distance.

4,329,032

AUTOMATIC FOCUS INDICATING DEVICE FOR CAMERA

Harumi Aoki, Kiyose, and Yoshio Sawada, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1980, Ser. No. 117,338
Claims priority, application Japan, Feb. 16, 1979, 54-16949
Int. Cl.³ G03B *13/18*
U.S. Cl. 354—25 **4 Claims**



1. A focus indicating device for a camera of the type including a photoelectric detection means for providing a focus signal corresponding to the degree of focus of said camera, said focus signal having a peak value when said camera is substantially in-focus, said device comprising:

means for generating from said focus signal a threshold signal having a value lower than said peak value;

means for comparing said focus signal with said threshold signal and for providing a focus detection output signal when said focus signal exceeds said threshold signal, to thereby provide a coarse indication that the focus condition of said camera is within a predetermined range of the in-focus condition, the value of said focus detection output signal varying in accordance with the difference between said focus signal and said threshold signal to thereby provide a fine indication that said camera is substantially in-focus; and

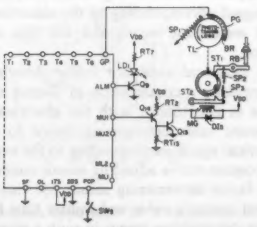
indicating means responsive to said focus detection signal for providing an indication of the focus condition of said camera, said indication varying in accordance with the value of said focus detection output signal.

4,329,033

DISTANCE DETECTING DEVICE AND A FOCUS CONTROL SYSTEM UTILIZING THE SAME

Makoto Masunaga; Takao Kinoshita, both of Tokyo; Toshio Sakane; Tokuichi Tsunekawa, both of Yokohama; Kazuya Hosoe, Machida; Takashi Amikura, Tokyo, and Isao Harigaya, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1980, Ser. No. 121,690
Claims priority, application Japan, Feb. 28, 1979, 54-22906
Int. Cl.³ G03B *3/10*; G01C *3/08*
U.S. Cl. 354—25 **57 Claims**



51. A system for detecting the focusing condition of an objective lens means with respect to an object, said lens means

having an optical axis and being movable along the axis, said system comprising:

distance detecting means for detecting the distance of said object and for producing distance data regarding the object distance;

first receiving means (e.g. **98**) for receiving a first type of electrical signal correlated with said lens means and for providing position data regarding the adjusted position of the lens means along the optical axis on the basis of said first type of electrical signal;

second receiving means (e.g. **CNT3, PSR2**) for receiving a second type of electrical signal correlated with said lens means which is different from said first type of electrical signal and for providing position data regarding the adjusted position of the lens means along the optical axis on the basis of said second type of electrical signal;

selecting means (e.g. **104**) for selecting said position data provided by said first receiving means and said position data provided by said second receiving means; and

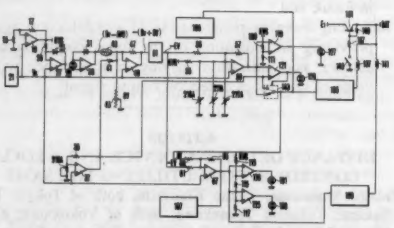
means (e.g. **106**) for receiving the selected position data selected by said selecting means and said distance data produced from said distance detecting means and for discriminating the focusing condition of said lens means with respect to the object.

4,329,034

CAMERA WITH PROGRAM SYSTEM

Hiroyasu Murakami, Tokyo; Masanori Uchidoi, Yokohama; Masayoshi Yamamichi, Kawasaki; Nobuhiko Shinoda; Masayuki Suzuki, both of Tokyo, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1980, Ser. No. 175,950
Claims priority, application Japan, Aug. 7, 1979, 54-100585
Int. Cl.³ G03B *7/087*
U.S. Cl. 354—37 **8 Claims**



1. A camera with a program system and for use with interchangeable lenses having different focal lengths, comprising:

(a) a light measuring means for producing an electrical signal corresponding to the amount of light from an object;

(b) a film sensitivity setting means;

(c) an exposure value setting means for producing an electrical signal corresponding to the electrical signal from the light measuring means and the film sensitivity setting means;

(d) an electrical exposure factor determining means for determining a combination of shutter time and aperture value in accordance with the electrical signal from the exposure value determining means so as to produce an electrical signal corresponding to the exposure factor; and

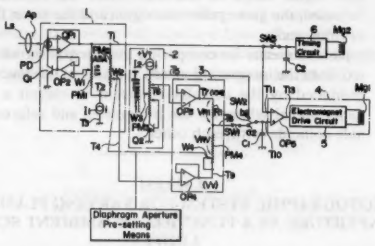
(e) a program curve adjusting means connected to the exposure factor determining means for varying the combination of aperture value and shutter time from the exposure factor determining means in such a manner that the aperture value determined by the exposure factor determining means decreases as the focal length of the interchangeable lens mounted on the camera increases.

4,329,035

EXPOSURE CONTROL SYSTEM FOR LENS INTERCHANGEABLE CAMERAS

Masayoshi Sahara, Sennan; Toshio Kobori, and Seiji Yamada, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 5,704, Jan. 23, 1979, abandoned. This application Dec. 31, 1980, Ser. No. 221,404
Claims priority, application Japan, Jan. 25, 1978, 53-7515
Int. Cl.³ G03B *7/087*
U.S. Cl. 354—37 **14 Claims**



1. An exposure control system for a camera having an interchangeable objective lens, a diaphragm mechanism defining a diaphragm aperture, preset means for presetting the f-number fo the diaphragm aperture, and a shutter mechanism for effecting an exposure, said control system comprising:

a light measuring circuit for generating an output signal having a level representative of the light from an object to be photographed;

a reference signal circuit for generating a reference signal having a predetermined level;

a program signal circuit for generating a program signal in accordance with said output signal and said reference signal, and including a series connection of a fixed resistance and a variable resistance, the latter being coupled with said preset means to be varied in accordance with the number of steps of the diaphragm aperture from the minimum f-number to a preset f-number, said program signal being obtained from the junction of said resistances with said output and reference signals being respectively applied to the end terminals of said series connection; and

an exposure control circuit for controlling the diaphragm aperture in accordance with said program signal and controlling the shutter mechanism in accordance with said output signal as determined with said diaphragm controlled.

4,329,036

POWER SUPPLY CIRCUIT FOR CAMERA

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

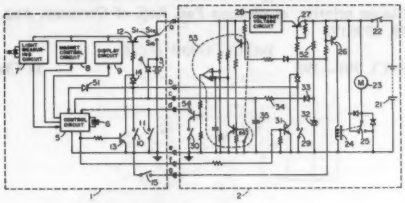
Filed Jan. 22, 1980, Ser. No. 114,203
Claims priority, application Japan, Feb. 1, 1979, 54-10748[U]
Int. Cl.³ G03B *1/00, 7/08*
U.S. Cl. 354—60 A **15 Claims**

1. In a system for a camera comprising a motor for film winding, a power source for supplying power to the motor, a first constant voltage circuit for converting output voltage of the power source to a constant voltage lower than the said output voltage and a solenoid for effecting exposure control upon receipt of the output voltage of the first constant voltage circuit, the improvement comprising a switching circuit connected between said power source and said first constant voltage circuit and supplying power to said first constant voltage circuit from said power source upon depression of a shutter button;

an oscillation circuit including a piezoelectric element, the oscillation circuit causing oscillation by the proper vibra-

tion frequency of the piezoelectric element and controlling said solenoid by the oscillation;

a second constant voltage circuit whose current consumption is small, the second constant voltage circuit convert-



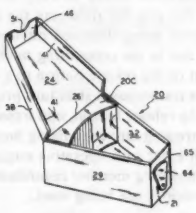
ing the output voltage of said power source to a constant voltage lower than said output voltage of the power source and transmitting the thus converted constant voltage always to said oscillation circuit to hold always the oscillation circuit in a stable oscillation state.

4,329,037

CAMERA STRUCTURE

Theodore G. Caviness, Philadelphia, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jun. 8, 1981, Ser. No. 271,425
Int. Cl.³ G03B *17/04*
U.S. Cl. 354—187 **3 Claims**



1. A camera in the form of a hollow polyhedron having structure therein for holding photo-sensitive sheet material in position by constraining the sheet along opposite sides thereof, said camera and said structure being formed from a pair of cut and scored blanks of paperboard or the like and comprising:

(a) a first blank having foldably connected rectangular front, trapezoidal-shaped top and bottom and rectangular rear panels;

(b) side panels foldably connected to said panels and foldable into erected position to define a structure of polyhedron shape;

(c) certain of the side panels being foldable with respect to said trapezoidal-shaped top panel and providing a cover extending over the side panels extending from said trapezoid-shaped bottom panel and said front rectangular panel;

(d) a second blank for forming a structure constraining said film material in position close to said rear panel and having a main panel with opposed side and opposed upper and lower flange elements extending from said main panel and foldably connected thereto;

(e) said upper and lower flange elements having curved edges against which photo-sensitive film material is constrained; and

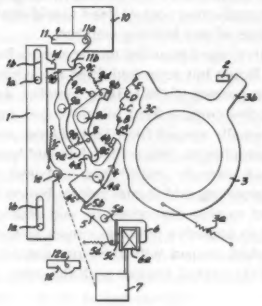
(f) an aperture in said front panel for transmitting light therethrough against said photo-sensitive material when in position close to said main panel.

4,329,038

AUTOMATIC FOCUSING CAMERA EQUIPPED WITH SELF-TIMER

Tadashi Nakagawa, Yotsukaido, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,033
Claims priority, application Japan, Sep. 3, 1979, 54/112550
Int. Cl.³ G03B *13/20, 17/40*
U.S. Cl. 354—195 **3 Claims**



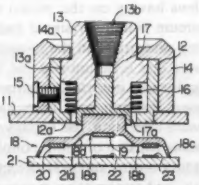
1. In an automatic focusing camera having an automatic focusing mechanism for automatically focusing the camera by detecting a distance between the camera and an object to be photographed, the combination comprising: a self-timer for controlling camera operation, said self-timer having a setting member movable between a position where said self-timer is inoperative and a position where said self-timer is operative; selecting means for selecting between an automatic focusing mode and a manual focusing mode; a manually operable shutter release member; and locking means actuated by said setting member for locking said shutter release member when said self-timer is actuated and said selecting means is selecting the automatic focusing mode and deactuated by said selecting means when said selecting means is selecting the manual focusing mode for releasing said shutter release member to permit shutter operation under control of said self-timer in the manual focusing mode.

4,329,039

SHUTTER RELEASE APPARATUS

Hirokazu Kaneko, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 27, 1980, Ser. No. 163,419
Claims priority, application Japan, Jun. 25, 1979, 54-079928
Int. Cl.³ G03B *17/38*
U.S. Cl. 354—266 **4 Claims**



1. A shutter release apparatus in a camera, said camera having a camera body and a shutter for controlled exposure of film, comprising:

a shutter release button having a normal position not operative of the shutter and an operative position which operates the shutter, mounting means to mount the shutter

release button to the camera body and permit sliding motion of said button upon operation from its normal to its operative position, spring means connected to said mounting means to return said shutter release button to its normal position after the shutter release button is released;

an insulative deformable elastic holding member having an inner face and an outer face, a central portion and a skirt portion;

a central electroconductive contact fixed to said central portion of the inner face of said holding member, a skirt electroconductive contact fixed to said skirt portion of the inner face of said holding member;

an insulative board mounted on the camera body and having a face facing but separated from the central contact and the skirt contact of the holding member, an inner electroconductive contact fixed to said board and aligned with and normally spaced from said central contact, an outer electroconductive contact fixed to said board and aligned with and normally spaced from said skirt contact;

means connecting said shutter release button to said holding member so that movement of said shutter button from normal to operative positions causes, in sequence, closure of the skirt contact with the outer contact and then closure of the central contact with the inner contact.

4,329,040

SIGNAL TRANSMITTING DEVICE OF AN INTERMEDIATE LENS BARREL OF A CAMERA

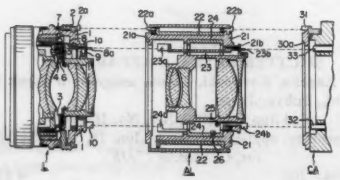
Kunihiro Fukino, Kawasaki, and Sunao Ishizaka, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 12, 1981, Ser. No. 242,887

Claims priority, application Japan, Mar. 19, 1980, 55-33922

Int. Cl.³ G03B *17/14*

U.S. Cl. 354—286 **5 Claims**



1. In an intermediate lens barrel mountable between an interchangeable lens having on the mount thereof means for generating a minimum F-number signal and a camera having means for detecting said signal on the mount thereof on which said interchangeable lens is mountable and including a circuit for receiving as inputs said detected signal and an output based on the light passed through said interchangeable lens and effecting an exposure operation, the improvement comprising:

transmitting means capable of being coupled to each of said signal generating means and said detecting means during said mounting, said transmitting means including correcting means for shifting the signal obtained from said signal generating means by an amount corresponding to the difference of the minimum F-number obtained as the result of the coupling of said interchangeable lens and said intermediate lens barrel from the minimum F-number of said interchangeable lens and transmitting said signal to said detecting means.

4,329,041

CAMERA HAND GRIP

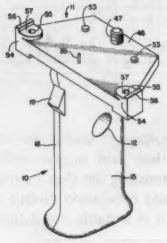
Joachim Mädge, Köslinstrasse 138; Günter Adamski, Koblenzer Strasse 46, and Claus Prochnow, Lange Strasse 38, all of 3300 Braunschweig, Fed. Rep. of Germany

Filed Aug. 27, 1980, Ser. No. 181,827

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935173

Int. Cl.³ G03B *17/56*

U.S. Cl. 354—293 **18 Claims**



1. A camera hand grip for separable connection to a camera, with a grip having a lateral fixing housing and with a connecting member between the grip and the camera body, which is separably connected to the grip via the fixing housing and which can be locked on the camera body, wherein the grip has a further lateral fixing housing disposed opposite the first fixing housing and an additional fixing housing accessible from the upper end face of the grip for receiving the connecting member, a release button being disposed on the grip, an axially displaceable push rod in the connecting member which transmits the movement of the release button to a shutter release of the camera body, a transmission structure provided in the grip for meshing with the release button, said transmission structure having an end protruding into each fixing housing so that each respective end can enter into operative engagement with the push rod of the connecting member regardless of which one of the three fixing housings are being used.

4,329,042

METHOD AND APPARATUS FOR REGENERATING PHOTOGRAPHIC PROCESSING SOLUTION

Arnost Libicky, Marly, and Walter E. Mueller, Fribourg, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 2,914, Jan. 12, 1979, Pat. No. 4,245,034. This application Aug. 27, 1980, Ser. No. 181,561

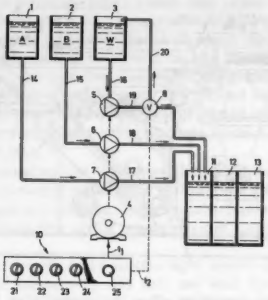
Claims priority, application Switzerland, Jan. 17, 1978, 462/78

Int. Cl.³ G03D *3/06*

U.S. Cl. 354—324 **4 Claims**

1. A device for regenerating and maintaining the activity of a photographic processing solution, said device comprising a processing tank for receiving exposed photographic material; three containers for storing two regenerating concentrates and the water of dilution, respectively; three time-controlled proportioning pumps for the concentrates and the water; lines operatively connecting the respective pumps to the concentrate and water containers and, in turn, to the processing tank; and an electric control system for the proportioning pumps wherein the control system comprises first input means for inputting the area of the photographic material, the exposed portion thereof and a characteristic variable dependent on the nature of the photographic material, and second input means for inputting the expected device throughput of photographic material; the control system determining the required amount of regenerator on each occasion from the parameters supplied

by the first input means and the required concentration of regenerator on each occasion from the parameters supplied by



the second input means, and actuating the proportioning pumps accordingly.

4,329,043

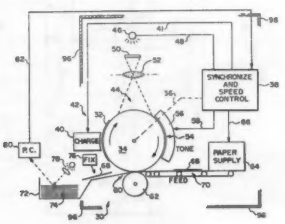
MULTIPLE COPY ELECTROPHOTOGRAPHIC REPRODUCING APPARATUS

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Systems Corporation, Bedford, Mass.

Division of Ser. No. 909,433, May 25, 1978, Pat. No. 4,241,160, which is a continuation of Ser. No. 723,098, Sep. 14, 1976, abandoned, which is a continuation of Ser. No. 517,173, Oct. 23, 1974, abandoned. This application Aug. 25, 1980, Ser. No. 180,701

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **8 Claims**



1. Apparatus for making multiple reproductions of the projected image of an object, said apparatus comprising:

(a) means carrying an electrophotographic member having a substrate with a photoconductive coating comprising an r.f. sputtered thin film, microcrystalline, wholly inorganic, dense, semiconductor material wherein the crystallites forming the coating are generally orthogonally oriented relative to the substrate, the coating having a dark resistivity of at least 10^{-14} ohm-centimeters and a ratio of dark and light resistivity of at least 10^4 and being electrically anisotropic, the coating at least being capable of accepting a charge and holding said charge at or below the surface to the extent that the latent image which is capable of being achieved thereat is substantially unaffected by toner development or transfer,

(b) a charging station having charging means proximate the coating for charging same only from the coating side of said member with a uniform charge at or below the surfae thereof and said coating being capable of holding the charge thereat,

(c) an exposure station including image projection means located immediately following the charging station for exposing the charged coating after the completion of charging to a projected image of the object to achieve a latent charge image with the charge at or below the surface of the coating,

(d) a toning station proximate the coating downstream from the exposure station and having toning means for toning the coating to achieve a visible toned image,

(e) an image transfer station having transfer means for transferring the toned image to a receptor to achieve a copy of the projected image,

(f) transport means for transporting the electrophotographic member and the respective stations relative to one another in a consecutive order seriatim for the operation of said respective means for charging, exposure, toning and transfer, said transport means being operative to repeat operation of the toning and transfer means while the charging and exposing means are disabled to provide second and more copies of the projected image in the absence of recharging and exposure and without heating or further charging to establish electric fields, the toning and transferring being effected while substantially maintaining the charge relationship and magnitude thereof along the dark decay curve characteristic of said photoconductive coating so that at least transfer is effected for plural copies without requiring supplementation of the fields representing the latent image, and means for controlling the operation of all said previously mentioned means in predetermined timed relation to one another.

4,329,044

CLEANING APPARATUS

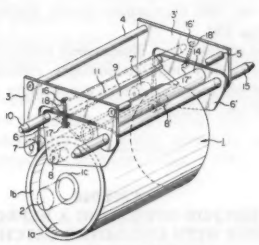
Tadayuki Kitajima; Toshirou Kasamura; Tomohiro Aoki; Yoshihiko Takeoka, all of Yokohama, and Kiyokazu Namekata, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 971,436, Dec. 20, 1978, abandoned. This application Jan. 9, 1981, Ser. No. 223,688

Claims priority, application Japan, Dec. 28, 1977, 52-160132

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **12 Claims**



1. A cleaning apparatus for use in an image forming apparatus of the type in which a developed image is formed on an image carrier and after the formed image has been used, said image carrier is cleaned up for repetitive use, said cleaning apparatus comprising:

a cleaning member;

means for supporting said cleaning member so that said cleaning member contacts said image carrier; and

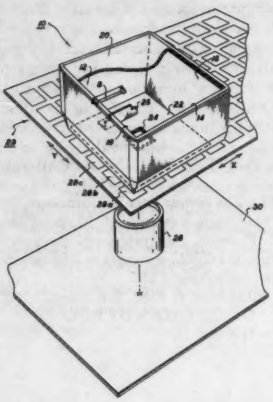
means engageable with said image carrier for grasping said image carrier, said grasping means comprising an outer surface pressing member disposed to apply a holding pressure on the outer surface of said image carrier and an inner surface pressing member disposed to apply a holding pressure on the inner surface of said image carrier.

4,329,045

ILLUMINATION SYSTEM FOR MICROFILM PRINTER

James D. Rees, Pittsford; George R. Simpson, Rochester, and David C. Blick, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1980, Ser. No. 138,767
Int. Cl.[3] G03B 27/54
U.S. Cl. 355—67 8 Claims



1. An illumination system providing diffusely uniform illumination of a microfilm image comprising:

a housing having a top and bottom surface, the bottom surface adapted to provide an aperture having dimensions at least equal to that of the microfilm image to be reproduced, said housing completely enclosed by side walls joined to said top and bottom surfaces, said housing further characterized by having its interior surfaces completely covered with a high reflectivity material, such that said surfaces are highly diffusely reflective to light incident herein,

means to position a microimage directly beneath said aperture,

at least one flash illumination source positioned within said housing, and

means to energize said illumination source to produce light flashes which undergo multiple reflections from said coated surfaces to produce a uniformly diffuse illumination of said microimage.

4,329,046

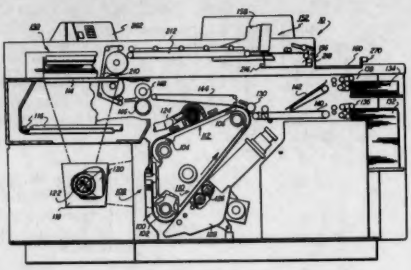
METHOD FOR OPERATING A REPRODUCTION MACHINE WITH UNLIMITED CATCH TRAY FOR MULTIMODE OPERATION

Robert A. Burkett; John W. Daughton, both of Fairport; Robert G. Ellis, Penfield; Raymond C. Wartinger, Webster, and Clayton L. Williamson, Jr., Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1979, Ser. No. 89,428
Int. Cl.[3] G03G 13/22, 15/00
U.S. Cl. 355—77 5 Claims

1. In a reproduction machine for producing impressions of an original, the reproduction machine having a photosensitive member and a plurality of operating components cooperable with one another and the photosensitive member in a plurality of modes to produce the impressions on support material, the reproduction machine also including a first tray for feeding the support material in an output tray, a method of operation comprising the steps of:

setting output tray limits for selected modes, operating in a selected mode having output tray limits,



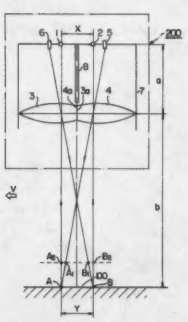
inhibiting operation after the output tray limit has been sensed, and automatically resuming operation upon unloading of the output tray within a set period of time.

4,329,047

OPTICAL VELOCITY MEASURING APPARATUS OF NON-CONTACT MEASUREMENT TYPE

Tetsuro Kikuchi; Hideaki Sasaya, both of Okazaki, and Yasumasa Ishihara, Nagoya, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 23, 1980, Ser. No. 114,598
Claims priority, application Japan, Feb. 8, 1979, 54-14069
Int. Cl.[3] G01P 3/36
U.S. Cl. 356—28 2 Claims



1. An optical velocity measuring apparatus of non-contact measurement type comprising:

a first light sensor and a second light sensor both disposed on a first object in a relation spaced apart by a predetermined distance from each other in a direction of traveling movement of said first object relative to a second object, said first and second light sensors receiving rays of light reflected from the surface of said second object and converting the incident rays of light into electrical signals indicative of the surface conditions of said second object;

a first lens and a second lens for condensing the rays of light reflected respectively from first and second visual points on the surface of said second object and directing the same toward said first light sensor and said second light sensor respectively, said first and second lenses being partly cut away by a plane parallel to the optical axis at a predetermined distance therefrom to be closely disposed opposite to each other at their cut-away portions to reduce a distance between said first and second visual points corresponding to a distance between optical axis of said first lens and said second lens while ensuring bright rays of light to be received by said first and second light sensors,

such that said first and second visual points move along substantially the same path on the surface of said second object irrespective of irregularities in a relative movement and relation position between said first object and said second object, and a first axis connecting between said first light sensor and a first point at which the image of said first light sensor is formed on the surface of said second object by said first lens extends in parallel with a second axis connecting between said second light sensor and a second point at which the image of said second light sensor is formed on the surface of said second object by said second lens;

means for evaluating the time-dependent relation between the electrical output signal from said first light sensor and that from said second light sensor thereby determining the velocity of said first object relative to said second object; and

a first light source (5) and a second light source (6) aligned along a line connecting said first and said second light sensors (1, 2) and located respectively outside of and spaced from said second light sensor (2) and said first light sensor (1) such that said first light source (5) illuminates through said second lens (4) said first visual point (A) and vicinity thereof and said second light source (6) illuminates through said first lens (3) said second visual point (B) and vicinity thereof.

4,329,048

LIGHT ABSORPTION SPECTRUM ANALYZER

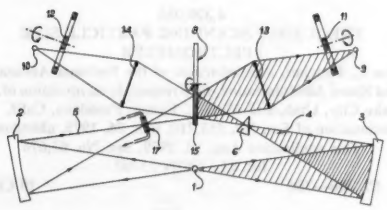
Robert Capitini, Le Perreux, and Paul Roveyaz, Cambes, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 11, 1980, Ser. No. 129,203

Claims priority, application France, Mar. 15, 1979, 79 06597

Int. Cl.³ G01N *21/85, 21/05;* **G01J** *3/42, 3/48*

U.S. Cl. 356—73 **19 Claims**



1. A spectrum analyser for the light absorption of a solution comprising a small transparent measuring cell having a thickness less than 5/10 mm, a height at most equal to 10 mm and width at most equal to 5 mm. containing the solution; means connected to the cell for circulation of the solution; a light source; means for dividing the beam of light of the source into two beams, one being the reference beam and the other the measuring beam transmitted respectively to a reference absorber element and to the measuring cell; means for selecting the measuring wavelength; means for modulating the reference and measuring beams which have respectively traversed the absorber element and the measuring cell; means for detecting the energies of each of the modulating beams after they have traversed the reference absorber element and the sample; the modulation means comprising alternate transparent and bi-reflecting sectors in front of each of the beams which have passed through the reference absorber and the measuring cell, said sectors being associated with means for selecting the wavelength of the beams in such a way that, as a function of the successive positions of the sectors relative to the beams, the detection means alternately receive the light transmitted by the sample and that transmitted by the absorber, the latter being such that it can independently absorb radiations of different wavelengths transmitted by the source and corresponding to the wavelength of the radiations absorbed by the components of the solution; means for comparing the energies of the modulated beams connected to detection means, wherein the modulating means are positioned directly behind the cell along the path of the divided measuring beam and immediately behind the absorber element on the path of the reference beam, the means for dividing the beam of the source being arranged in such a way that the measuring beam is converged on the cell.

4,329,049

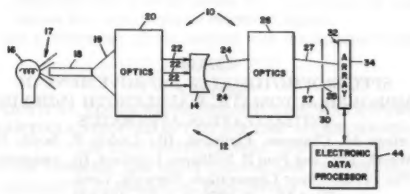
MEDIAN POINT DETECTING APPARATUS FOR A LENSMETER

George P. Rigg, Los Gatos; Tom N. Cornsweet, Menlo Park; J. Kirkwood H. Rough, San Jose; H. Malcolm Ogle, Palo Alto; Wallace R. Prunella, Sunnyvale, and Lawrence H. Schiller, Santa Clara, all of Calif., assignors to Rodenstock Instruments Corporation, Sunnyvale, Calif.

Filed Mar. 6, 1980, Ser. No. 127,797

Int. Cl.³ G01B *9/00;* **H01J** *40/14*

U.S. Cl. 356—124 **19 Claims**



1. Apparatus for determining the location of a point in a distribution of light at a detecting plane, comprising:

(a) a scanning photodiode array having a plurality of photodiodes and being positionable at the detecting plane to sense the light, said photodiodes being adapted to generate video signals proportional to the sensed light;

(b) means for integrating the video signals over the range of the light distribution to generate an integral signal having amplitude;

(c) means for detecting a predetermined amplitude of the integral signal to produce a detect signal; and

(d) means, responsive to the detect signal, for generating data representing the location of said point in the light distribution.

4,329,050

STRIP-FIELD SPECTRORADIOMETER

Arthur A. Olsen, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Oct. 30, 1979, Ser. No. 89,295

Int. Cl.³ G01J *3/18, 3/34*

U.S. Cl. 356—305 **26 Claims**

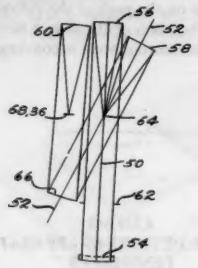
1. A spectroradiometer comprising:

an optically concentric telescope;

an optically concentric spectrograph;

a tilted, convex field mirror optically coupling said telescope

to said spectrograph so as to form an image at a final image surface thereof; and



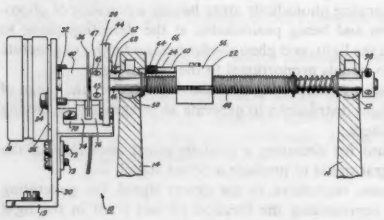
an array of charge coupled devices positioned at the final image surface of said spectrograph for detecting the image formed thereat.

4,329,051

SPECTROPHOTOMETER IMPROVEMENT OF IMPROVED AUTOMATIC WAVELENGTH INDEXING INITIALIZATION APPARATUS

Morteza M. Chamran, Elmhurst, Ill.; Larkin B. Scott, Fort Worth, Tex., and Paul B. Williams, Lombard, Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 7, 1980, Ser. No. 128,027
Int. Cl.³ G01J *3/28*
U.S. Cl. 356—320 **9 Claims**



1. In a spectrophotometer having movable diffraction means for diffracting light the improvement, of an apparatus for initialization of the wavelength indexing function of the diffraction means to a diffraction means initialization position, comprising:

drive means for driving the wavelength indexing movement of the diffraction means;

stop means for stopping said drive means;

sensing means for sensing the driving of the drive means and producing a signal while the drive means is driving; and

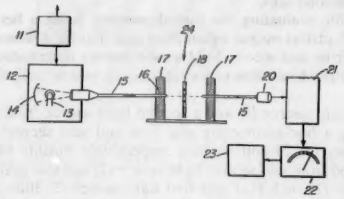
controller means for controlling the initialization, the controller means being operably connected to the drive means to command the drive means and operably connected to the sensing means for receiving the signal, the controller means initiating initialization by command to the drive means to drive, continuing initialization by maintaining the command while the signal is being received and concluding initialization by terminating the command to the drive means when the signal ceases.

4,329,052

METHOD AND APPARATUS FOR THE MEASUREMENT OF CELL SIZE IN A FOAM STRUCTURE

Edward A. Colombo, Fairport, and James T. Tsai, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 820,993, Aug. 1, 1977, abandoned, which is a continuation of Ser. No. 641,130, Dec. 15, 1975, abandoned. This application Mar. 28, 1979, Ser. No. 24,770
Int. Cl.³ G01N *15/07*
U.S. Cl. 356—335 **2 Claims**



1. A continuous method for controlling the average individual cell size of a moving plastic foam structure continuously emerging from a production extrusion source which comprises: illuminating a portion of the surface of said foam structure;

receiving and collecting the light which is transsmitted through said foam with a detector photocell;

continuously electrically measuring the amount of light energy received by said photocell whereby said light energy measurement is correlated to average cell size;

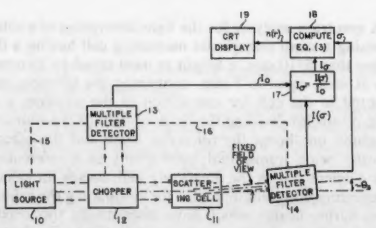
and controlling production process parameters to obtain a foam structure of predetermined average cell size in response to a predetermined amount of light energy received by said photocell.

4,329,053

FREQUENCY-SCANNING PARTICLE SIZE SPECTROMETER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, Salt Lake City, Utah, and Alain L. Fymat, Pasadena, Calif.

Continuation of Ser. No. 553,210, Feb. 26, 1975, abandoned. This application Aug. 10, 1979, Ser. No. 65,676
Int. Cl.³ G01N *15/02*
U.S. Cl. 356—336 **10 Claims**



1. A method for producing data values from forward scattered light for determining the size distribution of particles dispersed in a volume of gas independently of the refractive indices of the particles so that their chemical composition need not be known, even with a number of different species of particles dispersed in the volume, and even with a number of different species of gas in the volume, said method comprising the steps of

varying the wavelength of light incident on said particles in said volume in incremental steps within a total spectral range of about $0.20 \leqq \sigma \leqq 4.0\ \mu m^{-1}$, where σ is the wavenumber equal to the reciprocal of wavelength λ, and the

steps over this total range are at intervals of wavenumber, $\Delta\sigma$, of less than about 0.2 μm^{-1}, and for each interval, producing a signal representative of the wavenumber σ,

for each wavenumber, detecting at a fixed viewing angle the intensity of light forward scattered in a narrow cone by said particles in said volume, said fixed viewing angle being between 100 and 200 minutes of arc from the axis of the scattering cone which coincides with the direction of incident light, and from the intensity, $I(\sigma)$, of scattered light detected, generating a first electrical signal representing the value of intensity of forward scattered light at the narrow angle of detection,

for each wavenumber, detecting the intensity, I_o, of incident light and generating a second electrical signal representative of the intensity of incident light at the time forward scattered light is detected for the wavenumber,

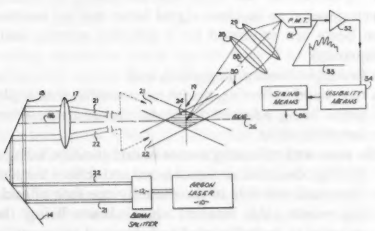
dividing the signal representative of the intensity of forward scattered light, $I(\sigma)$, for each wavenumber by the signal representative of the intensity of incident light, I_o, for the same wavenumber to obtain a signal representative of normalized forward scattered light, I_σ, thereby to provide a set of data for use in determining particle size distribution, n(r), for various values of radius, r, larger than approximately 1 μm as a function of the wavenumber σ and normalized scattered light, I_σ.

4,329,054

APPARATUS FOR SIZING PARTICLES, DROPLETS OR THE LIKE WITH LASER SCATTERING

William D. Bachalo, Dana Point, Calif., assignor to Spectron Development Laboratories, Inc., Costa Mesa, Calif.

Filed Aug. 16, 1979, Ser. No. 67,116
Int. Cl.³ G01N *15/02*
U.S. Cl. 356—336 **24 Claims**



11. The apparatus defined by claim **9** wherein said second collection means provides an output to enable said first collection means only when said scattering sensed by said second collection means exceeds a predetermined level.

4,329,055

INTERFEROMETER APPARATUS FOR MEASURING THE WAVELENGTHS OF OPTICAL RADIATION

Fritz-Peter Schaefer, Goettingen, Fed. Rep. of Germany, and Jan Jasny, Warsaw, Poland, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed Feb. 4, 1980, Ser. No. 117,880
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, 2904836
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—346 **5 Claims**

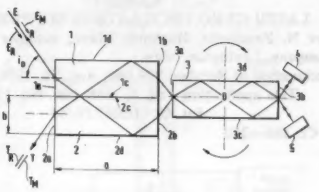
1. An interferometer apparatus for measuring the wavelengths of optical radiation, more specifically laser radiation, comprising:

an interferometer having

a reference radiation input for a reference beam of a given first wavelength,

a sample beam input for a sample beam of a second wavelength,

a beam splitter for splitting the reference and sample beams each into a pair of part-beams and with two part-beam optical paths, whose optical lengths may be changed in relation to each other, and designed for the reference beam and, parallel to it, for the sample beam, whose wave-lengths is to be measured, along two lines parallel to each other, and for combining returning part-beams into an output beam,



a rotatably supported optical part which is arranged in the part-beam paths and which when rotated has the effect of changing the length of the paths of the part-beams in relation to each other,

and a reflector system for reflexion of the part-beams, coming from the turning part, back into themselves,

a photo-electric detector means for converting the output beams into representative electrical signals,

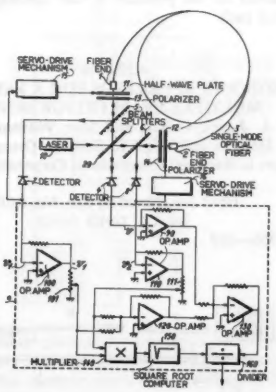
and a processing circuit coupled with the detector means.

4,329,056

OPTICAL FIBER INTERFEROMETRIC RATE GYRO PARTICULARLY ADAPTED TO THE MEASUREMENT OF LOW ROTATIONAL SPEEDS

Michel Lacombat, and Herve Lefevre, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 21, 1980, Ser. No. 123,483
Claims priority, application France, Feb. 23, 1979, 79 04660
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—350 **9 Claims**



1. An optical fiber interferometric rate gyro particularly adapted to the measurement of small rotational speeds comprising a coherent light source, a wound optical single-mode fiber, a device for splitting and recombining the radiation for splitting the radiation from said source into two waves directed respectively towards the two ends of said fiber and for recombining said two waves emerging from the fiber after traveling in opposite directions, a first device for detecting the radiation resulting from the recombination, additional splitters and re-

spective second and third detecting devices disposed between said splitting and recombining device and each of the ends of said fiber for detecting a fraction of each of the waves emerging from the fiber prior to recombination of the waves emerging from the fiber, and processing means for determining rotational speed based on a predetermined relationship between the recombined wave detected by said first detecting device and the respective fractions of the waves emerging from the fiber as detected by said second and third detecting devices.

4,329,057

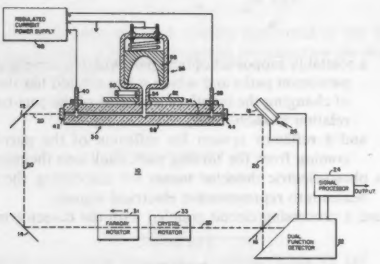
LASER GYRO OSCILLATION SUPPRESSION

Albert N. Zampiello, Boxboro, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 938,669, Aug. 31, 1978, abandoned. This application Aug. 4, 1980, Ser. No. 176,725

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **10 Claims**



1. A laser gyroscope comprising:

means for providing a reentrant optical path for the propagation of a plurality of waves having respectively different frequencies;

an amplifying medium in said path comprising a gas; and

means for stabilizing an electric discharge through said gas comprising means for providing a unidirectional magnetic field in a predetermined region of said discharge which is spaced from said optical path and which has substantially no affect on the portions of said discharge within said optical path.

4,329,058

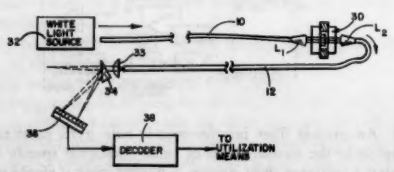
METHOD AND APPARATUS FOR A FABRY-PEROT MULTIPLE BEAM FRINGE SENSOR

Kenneth A. James, Corona Del Mar; William H. Quick, La Habra Heights, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 22, 1979, Ser. No. 5,265

Int. Cl.³ G01B *11/02*

U.S. Cl. 356—352 **17 Claims**



14. An optical transducer for sensing a physical parameter, said transducer comprising:

light source means,

first and second light transmitting means,

Fabry-Perot gap means formed between first ends of said first and second light transmitting means, each of said first ends having a partially reflective surface, said Fabry-Perot gap means receiving incident light signals from said source means via said first light transmitting means and supplying output light signals to said second light transmitting means,

said Fabry-Perot gap means having a dimension that is sensitive to a parameter change, the spectral characteristics of the output light signals being transmitted through said Fabry-Perot gap means providing an indication of the dimension of said gap means and, accordingly, the physical parameter to be sensed, and

means for detecting the spectral characteristics of said output light signals so as to provide the indication of said parameter.

4,329,059

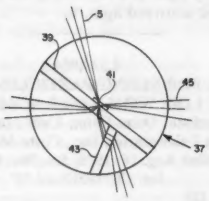
MULTIPLE CHANNEL INTERFEROMETER

Charles R. Pond, Federal Way; Patrick D. Texeira, Renton, and Reynold E. Wilbert, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 3, 1980, Ser. No. 126,959

Int. Cl.³ G01B *9/02*; **G02B** *27/10*

U.S. Cl. 356—353 **22 Claims**



1. A device for use in an interferometer, in which in said interferometer an incident signal beam and an incident reference beam are produced by a common source, said device comprising:

a first light transmitting plate, and

a two sided reflecting means on one side of said plate, said plate being adapted to be in operating position in the interferometer,

the plate and reflecting means in said position being adapted to filter the incident signal beam and reflect the same away from said one side of the plate by one side of said reflecting means, the incident signal beam being thereafter adapted to be collimated and directed to target,

the other side of the reflecting means in said position being adapted to receive the incident reference beam through the plate from the other side thereof,

the signal beam being adapted to return from the target enlarged with respect to said two sided reflecting means by diffractions so that it is adapted to pass around said last reflecting means and through said first plate and combine with the reference beam as it is reflected from the other side of the two sided reflecting means,

whereby both beams are adapted to be directed to a detector assembly for obtaining useful information.

4,329,060

NON-CONTACTING WORKPIECE GAUGING SYSTEM

Joseph Wilder, Princeton, N.J., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Apr. 14, 1980, Ser. No. 140,337

Int. Cl.³ G01B *11/14*

U.S. Cl. 356—375 **17 Claims**

1. A method of finding the position of a workpiece surface or the like relative to a reference, comprising the steps of:

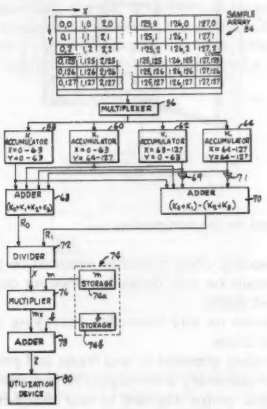
positioning a reference workpiece surface at each of two known positions relative to the reference;

at each of said known positions, illuminating a spot of the workpiece surface with a radiant energy beam, remotely detecting the illumination at each of a number of small areas of the reference workpiece surface to produce respective initial signals related to the illumination levels at the respective small areas;

converting the initial signals derived at each of said two known positions into a reference signal which is a function of the difference in overall illumination between selected larger areas of the reference workpiece surface at each of its two known positions;

illuminating a spot of the workpiece surface with a radiant energy beam;

remotely detecting the illumination at each of a number of small areas of the workpiece surface;



generating respective initial signals related to the detected illumination levels at the respective small areas of the workpiece surface;

converting said initial signals pertaining to said workpiece into a test signal which is a function of the difference in overall illumination between selected larger areas of the workpiece surface, the geometric relationship between the radiant energy beam and the workpiece being such that the illuminated spot moves along the workpiece surface with movement of that surface relative to the reference along a measurement direction; and

combining the test signal and the reference signal to produce a measurement signal indicative of the position of the workpiece surface relative to the reference.

4,329,061
TURNTABLE DEVICE FOR ANALYZING CHEMICAL SUBSTANCES

Martin Snook, Harrow; James M. Rideout, Sanderstead, and Alan Renshaw, Chesham, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 748,405, Dec. 8, 1976, abandoned, which is a continuation of Ser. No. 567,406, Apr. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 467,796, May 7, 1974, abandoned. This application Jun. 15, 1979, Ser. No. 48,775

Claims priority, application United Kingdom, May 7, 1974, 21935/73; Feb. 7, 1975, 4741/75; Feb. 7, 1975, 4742/75

Int. Cl.³ G01N *21/13, 33/48*

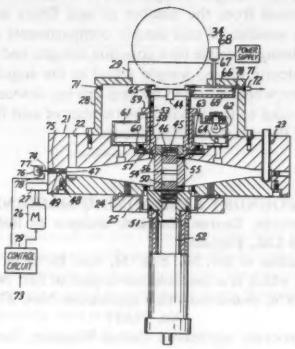
U.S. Cl. 356—414 **107 Claims**

1. Apparatus for analysing chemical substances comprising:

a turntable having a plurality of positions where discrete samples to be analysed can be carried,

means for moving the turntable so that said positions are advanced past a loading station into and through an analysing region having a multiplicity of analysing locations,

optical scanning means for sequentially directing light onto



all of the said positions at least once at each said analysing location, and

photosensitive means for measuring light which has passed through one of said samples.

4,329,062
POLYCHROMATIC PHOTOMETER

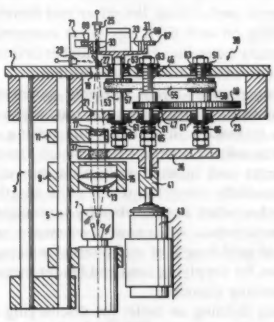
Hans-Peter Haar, Weilheim; Hermann Edelmann, D-Tutzing-Unterzeismering, and Sigmar Klose, Berg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 164,520

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930431

Int. Cl.³ G01N *21/13, 21/27*

U.S. Cl. 356—414 **15 Claims**



1. Polychromatic photometer comprising a sample wheel having a plurality of sample compartments therein arranged in a circle with the compartments being equiangularly spaced apart, a filter wheel spaced from said sample wheel and having a plurality of filters therein arranged in a circle with said filters being equiangularly spaced apart, means for rotating said sample wheel about an axis with the axis located in the center of the circle of the sample compartments and for rotating said filter wheel about another axis with the another axis being located in the center of the circle of said filters and each said axis extending normally of the circle within which it is located, a photometric measuring device having an optical path and said rotating means being arranged to bring each of the sample compartments and each of said filters in turn into the optical

path of said photometric measuring device, wherein the improvement comprises that said rotating means include a driving device for moving said sample wheel and filter wheel, the number of the sample compartments in said sample wheel being different from the number of said filters in said filter wheel, the number of said sample compartments and of said filters not being divisible by a common integer, and the ratio of angular velocity of said sample wheel to the angular velocity of said filter wheel afforded by said driving device being substantially equal to the ratio of the number of said filters to the number of the sample compartments.

4,329,063

FOUNDRY SAND MIXING MACHINE

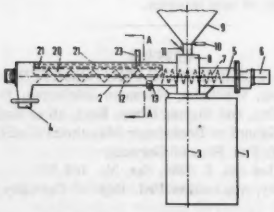
Albert Edwards, Bourne, England, assignor to Baker Perkins Holdings Ltd., England

Continuation of Ser. No. 894,724, Apr. 10, 1978, Pat. No. 4,175,866, which is a continuation-in-part of Ser. No. 724,670, Nov. 17, 1976, abandoned. This application Nov. 27, 1979, Ser. No. 97,617

Claims priority, application United Kingdom, Nov. 26, 1975, 48553/75

Int. Cl.³ B28C *5/00*; B01F *15/00*

U.S. Cl. 366—34 **12 Claims**



1. In a self emptying foundry sand mixer for mixing cold-setting foundry sand mixtures which have a tendency to adhere to and set upon parts within the mixer and thereby form a hardened coating on such parts, the mixer comprising:

a. an axially extending mixing chamber defining substantially circular section internal wall surfaces;

b. mixing element means rotatably mounted in the mixing chamber for rotation about at least one axis coaxial with such internal wall surfaces, the mixing element means having radially outer surfaces which are spaced from but close to said internal wall surfaces and which extend substantially along the whole axial length of the mixing chamber when at rest whereby revolution of the mixing element means will cause it to sweep substantially the whole axial length of said internal wall surfaces;

c. means for supplying sand and binder means to one end of the mixing chamber;

d. means defining an outlet for discharging a foundry sand mixture comprising said sand and binder means from the other end of the mixing chamber; and

e. drive means for rotating the mixing element means to move the foundry sand mixture from the supply end of the mixing chamber to the outlet in successive cycles;

the improvement wherein:

f. mixture set-inhibiting means is included for providing a liquid inhibitor, operable to prevent or retard the setting of the mixture on said surfaces and mixing element means between the mixing of successive mixes to maintain the residual mixture in the mixer soft; the means including openings along the mixing chamber leading to the interior of the mixing chamber for dispersing the inhibitor over said wall surface and mixing element means, and a liquid inhibitor supply source connected with said openings.

4,329,064

HYDROSTATIC-MECHANICAL DRIVE FOR VEHICULAR CEMENT MIXERS

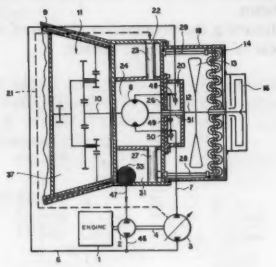
Egon Mann, and Helmut Eymüller, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 116,978

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1979, 2904107

Int. Cl.³ B28C *5/18*

U.S. Cl. 366—61 **17 Claims**



1. A cement mixer comprising:

a frame;

a cement-mixing drum rotatably mounted on said frame;

tapping means on said frame for drawing cement mixture from said drum;

loading means on said frame for conveying raw materials into said drum;

a drive housing attached to said frame and provided with a chamber stationary with respect to said frame;

a hydrostatic motor disposed in said chamber for rotating said drum, said chamber collecting leakage fluid from said motor;

transmission means in said housing connected to said motor and to said drum for transmitting rotary power thereto from said motor;

drive means including a pump on said frame connected to said motor by hydraulic lines for energizing same with said fluid;

a tank rigidly connected to said housing and substantially surrounding said chamber for storing pumping fluid, whereby noise produced by said motor is absorbed; and

means connecting said tank to said lines for recharging same with pumping fluid and to said chamber for replenishing said tank with fluid leaked into said chamber from said motor.

4,329,065

APPARATUS FOR PROCESSING PLASTIC AND POLYMERIC MATERIALS

Peter Hold, Milford, Conn., and Zehev Tadmor, Teaneck, N.J., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 971,331, Dec. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,181, Nov. 7, 1977, abandoned. This application Sep. 24, 1980, Ser. No. 190,465

Int. Cl.³ B01F *7/10*; B21C *23/00*; B29B *3/02*

U.S. Cl. 366—97 **19 Claims**

1. Apparatus for processing plastic and polymeric material comprising:

(a) a rotatable element carrying a plurality of adjacent annular processing channels including opposed side walls;

(b) a stationary element providing a coaxial surface cooperatively arranged with said adjacent annular processing channels to provide enclosed processing passages;

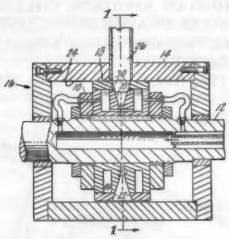
(c) inlets in said stationary element for introducing material to said processing channels;

(d) outlets in said stationary element for discharging material from said processing channels;

(e) means interconnecting said adjacent annular processing passages so that material discharged from the outlet of one of said adjacent processing channels is fed to the inlet of the next adjacent processing channel;

(f) blocking members associated with said stationary element in proximity to said outlets and extending into said adjacent processing channels and substantially blocking said channels, said blocking members having a cross-sectional configuration complementary to the cross-sectional configuration of said processing channels and being positioned therein to impede further advance of material in said processing channels and to cooperate with the outlets of said processing passages to discharge said material and,

(g) spreader members associated with said stationary element and extending into said adjacent processing channels over substantially the full depth of said processing channels at a location proximate to, but offset in the direction of rotation of said processing channels from said inlets whereby said spreader members are spaced a substantially



major portion of the circumferential distance of said passage from said blocking members of said adjacent processing channels, said spreader members having cross-sectional configurations complementary to the cross-sectional configurations of said adjacent processing channels and being of lesser width in cross-section than said processing channels to provide a relatively narrow clearance between each of said opposed side walls of said processing channels and said spreader members thereby to block advance of material in a central portion of said adjacent processing channels and to spread liquid material on the rotating side walls and permit said spread material to be carried past said spreader members toward said blocking members as a thin layer on the side walls whereby a free central space is provided in each of said adjacent processing channels in advance of said spreader members in the direction of rotation of said processing channels; and

(h) ports in said stationary element in advance of said spreader members in the direction of rotation of said adjacent processing channels and providing access to said free central spaces formed by said spreader members during operation of the apparatus.

4,329,066

METHOD AND APPARATUS FOR CONTINUOUSLY MIXING A LIQUID AND POWDER

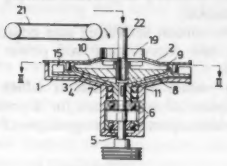
Nemo Ivarson, Skönviksvägen 253, S-122 42 Enskede, Sweden

Filed Sep. 22, 1980, Ser. No. 189,164

Int. Cl.³ G01F *15/02*

U.S. Cl. 366—150 **4 Claims**

1. An apparatus for continuously mixing liquid and powder together to form a substantially homogenous mixture, comprising; a mixer and a mixer housing, separate lines for supplying liquid and powder, the mixer housing comprising a wheel arrangement arranged for rotation on a shaft in the mixer housing, whereat the liquid discharges into a cavity in the wheel while the powder line discharges into powder-accommodating spaces in the upper part of the wheel, and the cavity communicating with the upper side of said wheel via a circumferentially extending gap which opens out adjacent a circumferentially extending edge located on the peripheral side of the gap, the shape of the gap corresponding substantially to the



shape of the outer surface of a truncated cone with the apex of said cone facing downwardly, and the mixer housing including mixer pins arranged to capture liquid from the mist curtain and the powder thrown out by centrifugal force from the powder spaces, to provide said misture.

4,329,067

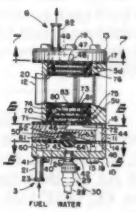
FLUID MIXER

Paul R. Goudy, Jr., 8920 W. Hampton Ave., Milwaukee, Wis. 53225, assignor to Bruce J. Landis; Kenneth J. Landis and Paul R. Goudy, Jr., a part interest

Continuation-in-part of Ser. No. 897,670, Apr. 19, 1978, Pat. No. 4,259,021. This application Jan. 4, 1980, Ser. No. 109,490

Int. Cl.³ B01F *5/06, 15/02*

U.S. Cl. 366—182 **39 Claims**



1. A valve for controlling the delivery of one fluid into another, comprising a first fluid chamber; first delivery means for delivering one fluid into said first fluid chamber; second delivery means for delivering another fluid into said first fluid chamber; a further fluid chamber in fluid flow relation with said first fluid chamber and through which fluid from the latter ordinarily must pass to exit the valve; and differential pressure responsive control means responsive to the fluid pressures in said first and further fluid chambers for controlling flow of said first fluid into said first fluid chamber.

4,329,068

MIXING MACHINE

Terry E. Neuner, 504 Westmount Ave., Columbia, Mo. 65201, and Gresham Michael E., Rte. 5, Box 360, Fulton, Mo. 65251

Filed Apr. 21, 1980, Ser. No. 142,401

Int. Cl.³ B01F *11/00*

U.S. Cl. 366—214 **6 Claims**

1. A machine for mixing chemical solutions contained in a plurality of glassware containers, said machine comprising:

a rack structure adapted to hold the containers in upright positions in spaced apart relation to one another;

a frame adapted to rest on a support surface;

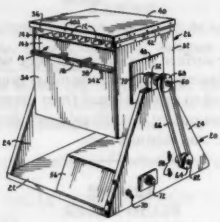
a tumbler mounted on said frame for rotation about a substantially horizontal rotational axis, said tumbler being adapted to closely receive said rack structure;

power means for driving said tumbler about said rotational axis to tumble said containers, thereby mixing the chemical solutions contained therein;

means for maintaining the containers substantially stationary relative to said tumbler during rotational movement thereof, whereby to prevent shifting of the containers in the tumbler;

an electric circuit activating said power means when completed and deactivating said power means when interrupted;

a timing switch in said circuit which is closed to effect completion of said circuit for a preselected time period and which opens following elapse of said time period;



a normally closed switch arranged in said circuit in parallel with said timing switch to normally maintain said circuit in a completed condition regardless of the state of the timing switch; and

means for opening said normally closed switch each time said tumbler is oriented to orient said containers in upright positions, whereby said timing and normally closed switches are both open to interrupt said circuit only after said preselected time period has elapsed and said tumbler has reached an orientation to orient the containers in upright positions.

4,329,069

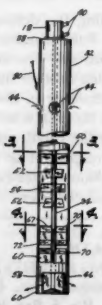
MANURE PIT STIRRING SYSTEM

Scott W. Graham, Gibson, Iowa 50104

Filed Jul. 14, 1980, Ser. No. 168,540

Int. Cl.³ B01F *5/10, 5/12, 7/04*

U.S. Cl. 366—270 **10 Claims**



1. A manure pit having a stirring system comprising,

a manure pit having spaced access openings along one side,

a portable stirring device movable between said access openings and insertable therein for stirring liquid and solids in said pit,

said stirring device including an elongated tube having an upper end disposable at the top of the pit and a lower end disposable in the bottom of the pit, said upper end having liquid inlet openings and said lower end having an outlet opening, and a pump in said tube for drawing liquids in said inlet openings and discharging it out said outlet opening whereby liquid drawn in at the top is pumped out into solids on the bottom of the pit thereby mixing and stirring the liquid and solids in said pit,

said pump including a shaft extended axially through said tube and having blade means along its substantial length for moving said liquid downwardly from said inlet openings to said outlet opening,

said blade means including a plurality of generally radially extending and circumferentially spaced-apart paddles on said shaft at the lower end of said tube,

said paddles including an upright body portion and an upper portion inclined relative to said body portion and including a leading edge offset from said body portion in the direction of rotation of said shaft, and

a convex upwardly end wall being positioned at the lower end of said shaft below said paddles for directing liquid in said tube radially outwardly through said outlet opening.

4,329,070

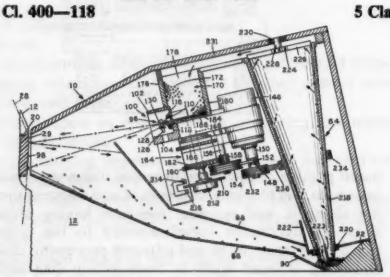
METHOD OF AVOIDING COLLISIONS OF PROJECTILES IN A MICROBALLISTIC PRINTER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Nov. 7, 1980, Ser. No. 205,003

Int. Cl.³ B41J *3/02*

U.S. Cl. 400—118 **5 Claims**



1. A method of operating a microballistic printer having a gun for firing projectiles in succession across a space to a platen having a printing area to form characters on a medium placed against the platen, including the steps of positioning the gun spaced from a plane normal to and outside of a boundary of the printing area of the platen and moving the gun to form characters in successive steps, each moving step being in a direction toward the gun, whereby every subsequently fired projectile prints in a direction away from a previously fired projectile rebounding from the platen, thereby avoiding collision of a subsequently fired projectile with a previously fired projectile rebounding from the platen.

4,329,071

CURRENT COLLECTOR FOR RESISTIVE RIBBON PRINTERS

Steven L. Applegate, and Stanley Dyer, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,658

Int. Cl.³ B41J *3/04*

U.S. Cl. 400—120 **9 Claims**

1. A signal coupling arrangement for use in a printer of the kind that utilizes a ribbon having an outer layer that is moderately conducting, an outer ink transfer layer and an intermediate conducting layer, said printer further including

a printhead arranged with a set of electrodes in contact with said moderately conducting layer,

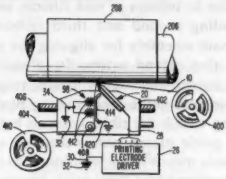
means for causing relative movement for swiping said print-

head along said ribbon in a printing direction to define a takeup end of said ribbon relative to said printhead, and

energizing means for selectively applying printing signals to said electrodes, said energizing means having a terminal to which said printing signals must be coupled to effect printing transfers of said ink layer,

said signal coupling arrangement comprising

electrical contacting means located on said takeup side of



said printhead and adjacent said ink transfer layer of said ribbon,

pressure means for holding said ribbon in intimate contact with said contacting means to establish an electrical contact with said conducting layer through said ink transfer layer,

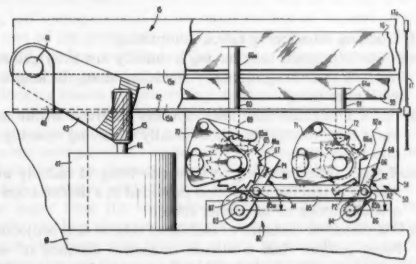
means for connecting said contacting means to said terminal whereby a printing signal path is established from said printhead through said ribbon to said terminal.

4,329,072

RIBBON FEED AND LIFT MECHANISM FOR A TYPEWRITER

Donald J. Kacmarcik, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1979, Ser. No. 89,662
Int. Cl.³ B41J *33/14*
U.S. Cl. 400—208 **21 Claims**



1. In a typewriter having provisions for receiving a typewriter print ribbon cartridge and a correction ribbon cartridge in superimposed relation to form a cartridge assembly, each of said cartridges including separate ribbon advancing means therein for moving respectively typewriter print ribbon and typewriter correction ribbon therethrough externally of said cartridges; cartridge assembly support means underlying said cartridge assembly and providing support therefor, and drive means for reciprocating said support means for presenting selectively different portions of said ribbons to a print point along a print line, only the respective ribbon being advanced which is presented to said print point, the improvement comprising:

first and second, spaced apart ratchets, each having ratchet teeth thereon and connected respectively to respective ones of said ribbon advancing means;

depending bracket means supporting said ratchets from said support means, said second ratchet connected to said correction ribbon advancing means and having ratchet teeth with a greater pitch than the teeth of the first ratchet;

first and second spaced apart drive pawl means pivotally mounted on said typewriter for engaging respectively said first and second ratchets during reciprocation thereof; and

link means interconnecting said drive pawl means so that upon reciprocation of said support means a distance equal to or greater than the pitch of said teeth of said first ratchet but less than the pitch of the teeth of said second ratchet, only said first ratchet moves due to the engagement of said first drive pawl means with said first ratchet;

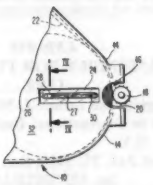
said second drive pawl means positioned so that upon reciprocation of said support means exceeding the pitch of the teeth of said second ratchet, said second drive pawl means effects movement of said second ratchet, said second ratchet operative for displacing said second drive pawl means about its pivot to displace said first drive pawl means because of said link means, away from said teeth of said first ratchet.

4,329,073

SINGLE USE RIBBON CARTRIDGE WITH FRANGIBLE RESISTIVE ELEMENT FOR RESTRAINING THE TAKEUP SPOOL

James A. Craft, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1980, Ser. No. 213,718
Int. Cl.³ B41J *32/00*
U.S. Cl. 400—208 **14 Claims**



6. A ribbon cartridge having walls and a chamber therein, separate takeup and supply spools and a ribbon extending therebetween, said takeup spool having an axle extending outward through said walls of said cartridge; means acting to resist translatory movement of said takeup spool, said means acting to resist movement comprising a frangible wall section engaging said axle and progressively yieldable to said axle as said takeup spool and axle translate.

4,329,074

RIBBON SWITCHING DEVICE FOR A PORTABLE TYPEWRITER

Kokichi Sanada, Tokyo, Japan, assignor to Fuji Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1980, Ser. No. 161,795
Int. Cl.³ B41J *35/14*
U.S. Cl. 400—216.5 **7 Claims**

1. In a typewriter having a ribbon holder, type keys ribbon lifting means for supporting the ribbon holder, a ribbon switching key and an actuating means for actuating a platen when one of the type keys is operated, and an improved ribbon switching device comprising:

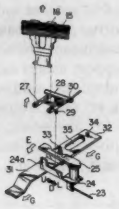
said ribbon lifting means including a shaft pivotably mounted on a bearing means, a crank frame for supporting said ribbon holder, an operating bar integrally formed with said shaft and said bar projecting downwardly, and a torsion spring mounted on said shaft and said crank frame for urging downwardly said crank frame about said shaft;

said actuating means comprising a connecting strip movable forwardly in a predetermined stroke when one of said type keys is operated, a push plate connected to said

connecting strip for actuating said platen, and a projection integrally formed with said push plate at the forward end thereof;

a reciprocally slidably mounted switch base, a linkage connecting one end of said switch base for operation by said switching key, the other end of said switch base being integrally formed with a projecting portion; and

a switching arm pivatably mounted on said switch base, the



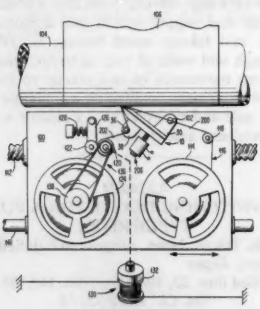
rear side edge of said switching arm being formed with a lower lifting step and an upper lifting step, said switching arm being located between said projection and said projecting portion, the front side edge of said arm being always contacted with said operating bar; whereby said projection pushes either said lower lifting step or said upper lifting step when a type key is depressed so that said ribbon lifting means is lifted up in a predetermined degree according to the movement of said switching arm.

4,329,075

PRINTHEAD ASSEMBLY FOR TYPEWRITERS OR THE LIKE

Steven L. Applegate, and James J. Molloy, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,674
Int. Cl.³ B41J *33/04*
U.S. Cl. 400—229 **13 Claims**



1. For use in a printer of the kind that includes ribbon supply means and ribbon takeup means between which a ribbon is transferred over a ribbon path, document holder means for supporting a receiving medium, a printhead having a printing end that is adapted to swipe along said printing ribbon for producing marks on said receiving medium, and means for causing relative motion between said printhead and document holder means to define a printing line at said document holder means,

an arrangement comprising:

an assembly that includes a printhead holder to which said printhead is firmly mounted, pivot means, connected to said printhead holder, for mounting said assembly for rotation to positions about a pivot axis that include a normal printing position in which said printing end of said printhead is located at said printing line,

means for defining a section of said ribbon path extending over said assembly, said defining means including first ribbon guide means, mounted to pivot as a part of said assembly, for causing said ribbon to wrap around said printing end of said printhead;

and means for maintaining essentially zero torque about said pivot axis due to tension in said ribbon, said maintaining means including second and third ribbon guide means separate of said assembly for aligning the sections of said ribbon path that extend externally of said assembly and toward said takeup and supply means, respectively,

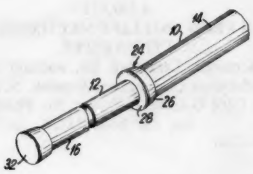
said first and second guide means being positioned so that the line along which the ribbon travels between said first and second guide means passes through said pivot axis, said third guide means being positioned so that the path of said ribbon between said third guide means and said printhead passes through said pivot axis.

4,329,076

TELESCOPING TUBES WITH A TWIST LOCKING ARRANGEMENT

Alois Coreth, Fort Lee, N.J., assignor to Lapides Corporation, Paterson, N.J.

Filed Aug. 21, 1980, Ser. No. 180,117
Int. Cl.³ F16B *7/10*
U.S. Cl. 403—109 **8 Claims**



1. Locking telescoping tubes, comprising:

an outer elongated tube having a radially inwardly projecting lock seam longitudinally extending along the length of said outer tube;

an inner elongated tube telescopically received within said outer tube through a telescopically receiving opening of said outer tube;

said inner tube including at least one integral radially outwardly extending projection provided as a deformation of a wall portion of said inner tube;

a first diametric distance of said inner tube at said projection being greater than a second diametric distance of said outer tube measured at said lock seam and less than a third diametric distance of said outer tube measured at a position other than at said lock seam;

whereby said outer and inner tubes can be telescopically arranged in a clearance fit relationship to be adjusted at a desired relative axial position and then relatively rotated so that said projection is displaced in a direction angularly away from said lock seam such that said inner tube becomes eccentric with respect to said outer tube and said outer and inner tubes are arranged in an interference fit relationship.

4,329,077

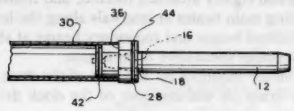
UNDERGROUND PIPE PUSHER

Edward J. Bouplon, Streetsboro, Ohio, assignor to Allied Steel & Tractor Products, Inc., Solon, Ohio

Filed Oct. 14, 1980, Ser. No. 196,867
Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—287 **7 Claims**

1. An adaptor for use is underground pipe pushing, said

adaptor comprising a cylindrical body which is axially split to form congruent portions, said body being formed with a tapered axial hole, a shoulder disposed about the periphery of the body, and at least one elastic member surrounding the body for maintaining the portions in assembled condition.

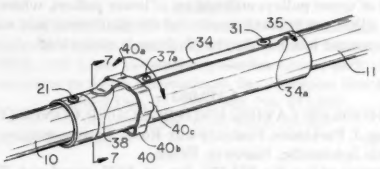


4,329,078

SPLICE JOINT LOCK

Thomas B. Crates, and James M. Crates, both of Charlotte, N.C., assignors to Jameson Corporation, Charlotte, N.C.

Filed Mar. 3, 1980, Ser. No. 126,342
Int. Cl.³ F16B 7/10
U.S. Cl. 403—316 **13 Claims**



1. In a splice joint for releasably joining two poles together end to end, one of the poles having an end portion of a reduced diameter for being matingly positioned in a tubular end portion of the other pole, both poles having a through hole in a radial wall of their respective end portions for being positioned in superimposed relation with each other, and an axially extending leaf spring secured to the outer surface of the end portion of one of the poles and having an inwardly extending finger toward the free end thereof for being positioned under spring tension in the superimposed holes; the combination therewith of locking means for preventing inadvertent withdrawal of the finger from the superimposed holes, and comprising an arcuate clamp member rotatably positioned on one of the poles astride the leaf spring and having an inner surface comprised of a first, relatively large diameter segment which, when rotated into radial alignment with the leaf spring, permits withdrawal of the finger from the superimposed holes, and a second, relatively smaller diameter segment which, when rotated into radial alignment with the leaf spring, frictionally engages and clamps the leaf spring to the pole and prevents withdrawal of the finger from the superimposed holes, said clamp member adapted to freely slide along the longitudinal extent of the leaf spring when said relatively large diameter segment of the inner surface thereof is radially aligned with the leaf spring, and wherein said ring is adapted to frictionally engage and clamp the leaf spring to the pole at a point between the finger and the free end of the leaf spring.

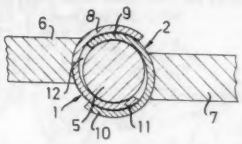
4,329,079

COUPLING DEVICE

Ebbe G. Milding, Mölnlycke, Sweden, assignor to Molnlycke AB, Gothenburg, Sweden

Filed Feb. 7, 1980, Ser. No. 119,430
Claims priority, application Sweden, Feb. 16, 1979, 7901392
Int. Cl.³ F16B 1/00
U.S. Cl. 403—319 **6 Claims**

1. Coupling device comprising at least two profiled tube-like elements and a locking rod, one of the tube-like elements being attached to a first object and the other element being attached to a second object to be connected together with the first object, each of said tube-like elements having along its entire length an open slot opposite its respective object with a width dimension less than the largest internal cross-sectional dimension of the elements and arranged symmetrically on each element defining an outwardly-directed opening, both tube-like elements being insertable into each other via their open slots, so that a first circumferential portion of the one element grasps around the outer periphery of the first circumferential portion of the other element, and so that the second circumferential



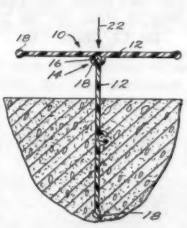
portion of the other element grasps around the outer periphery of the second circumferential portion of the one element, and so that the tube-like elements form together a sleeve-like unit, into the cavity of which the locking rod can be inserted to lock the tubes to each other, said locking rod being clamped between the second circumferential portion of the one tube-like element and the first circumferential portion of the other tube-like element, said tube-like elements being made of an elastic material and being relatively thin walled, so that they are traversely compressible and expandable by said locking rod.

4,329,080

JOINT FORMER

John E. Elley, Henrietta, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Sep. 15, 1980, Ser. No. 186,013
Int. Cl.³ E01C 11/02
U.S. Cl. 404—74 **8 Claims**



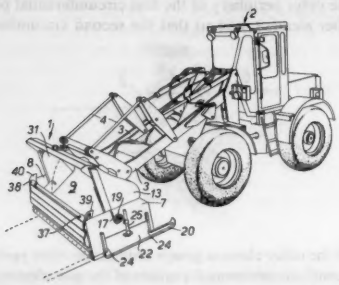
7. A method of forming joints in a mass of hardenable material of plastic consistency comprising forming a two-part assembly of generally T-shaped cross-section by releasably attaching a longitudinal edge of a web member to a longitudinal center portion of a surface of an essentially identical web, said edge and longitudinal center portion being configured to form a two-part releasable friction coupling; inserting the web forming the body of the T into the plastic mass; detaching the web forming the bar of the T; releasably attaching the removed web to another essentially identical web by means of the friction coupling formed by those two webs so as to form a second generally T-shaped assembly; and inserting the web forming the body of the second assembly into hardenable material.

4,329,081

DEVICE FOR LAYING ROAD MATERIAL

Stig Buvik, P1 6165, S-685 00 Torsby, Sweden

Filed Apr. 15, 1980, Ser. No. 140,494
Claims priority, application Sweden, May 4, 1979, 7903901
Int. Cl.³ E01C *19/18*
U.S. Cl. 404—110 **8 Claims**



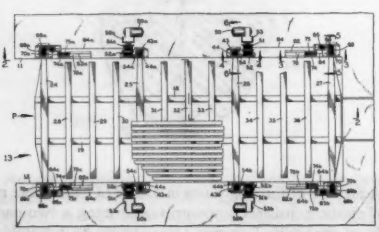
1. A device for laying road material while towed by a towing vehicle, said device comprising trough-shaped bucket means for holding said road material during transport and for discharging said road material during laying thereof, back wall means, located at the back of said bucket means, for determining the upper surface of the laid layer of road material, said bucket means having gable ends and a back edge and being rotatable, in relation to said back wall means, about a horizontal fulcrum parallel to the back wall means to discharge road material in said bucket means out into a space between the back edge of the bucket means and the back wall means, a pair of adjustable partition means located between the gable ends of the bucket and extending into the space between said back edge and said back wall means to determine the width of the layer of road material to be laid, and joint means disposed adjacent each said gable end for receiving said partition means and for providing a location about which the partition means can be swung.

4,329,082

SHIPLIFT APPARATUS

Michael E. Gillis, P.O. Box 22386, Fort Lauderdale, Fla. 33335

Filed May 22, 1980, Ser. No. 152,343
Int. Cl.³ B63C *3/06*
U.S. Cl. 405—3 **19 Claims**



17. In an apparatus for lifting or lowering a water-borne structure, said apparatus having:

a dock having spaced apart, opposite sides and an open end between said sides through which the water-borne structure can enter and leave;

a support platform extending between said opposite sides and movable vertically between a lowered position below water and raised position above water, said support platform comprising a plurality of longitudinal horizontal beams spaced apart laterally from each other and each extending generally parallel to said opposite sides of the dock, and a plurality of transverse horizontal beams extending substantially perpendicular to said longitudinal beams and rigidly attached thereto, said transverse beams including main beams at intervals along the length of said longitudinal beams and secondary beams at shorter intervals between successive main beams;

a drive motor mounted on one side of the dock;

a rotary drum on said one side of the dock driven by said motor;

a set of lower pulleys mounted on one of said main transverse beams at the end thereof adjacent said one side of the dock;

a set of upper pulleys mounted on said one side of the dock above said set of lower pulleys;

and a flexible cable fastened at one end to said drum and operatively engaging said upper and lower pulleys and extending between them to impart an upward force to said one main transverse beam upon rotation of said drum in one direction;

the improvement which comprises:

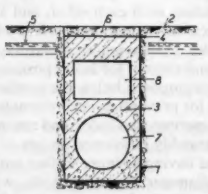
fluid-operated adjusting means acting on said opposite end of said cable for adjusting the latter's length between said set of upper pulleys and said set of lower pulleys, whereby to adjust the vertical position of the platform at said main transverse beam while the platform is under load.

4,329,083

METHODS OF LAYING UNDERGROUND CONDUITS

Jonathan J. Parkinson, Fontenay-aux-Roses, France, assignor to Societe Soletanche, Nanterre, France

Continuation of Ser. No. 872,672, Jan. 26, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,516
Claims priority, application France, Jan. 26, 1977, 77 02140; Sep. 13, 1977, 77 27591
Int. Cl.³ F16L *1/00*
U.S. Cl. 405—154 **11 Claims**



1. A method of installing a conduit in the ground comprising digging a trench in the ground while keeping said trench at least partially filled with a thixotropic mud to prevent collapse of the trench walls and installing the conduit in said trench, said thixotropic mud containing hardenable sealing products at least in the part of said trench wherein said conduit is located, and retaining said conduit in said trench to seal it in the ground after said products have hardened.

4,329,084

DITCHING OVER BURIED LINES

Amadeo Chapa, 4 Talisman Ct., Houston, Tex. 77076

Filed Feb. 25, 1980, Ser. No. 124,154
Int. Cl.³ F16L *57/00*
U.S. Cl. 405—157 **4 Claims**

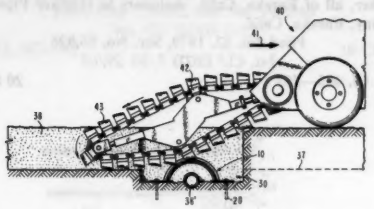
1. A method of digging a trench along a predetermined trenchline in a terrain in which a pipe is buried below the ground surface, so that the bottom of the trench is above the pipe and the trenchline has with the pipe a point of intersection in a vertical plane, comprising:

making a hole in the ground at said intersection at a depth approximating the desired depth of the trench,

positioning at the bottom of the hole an arch structure for

spanning and covering a small section of the pipe underneath the hole, and

moving a trenching machine along the trench line toward said hole, the machine having a continuously movable



chain for excavating the trench as it moves, and said chain riding over said arch structure, thereby allowing the machine to continuously dig out the trench over the pipe but without cutting the pipe.

4,329,085

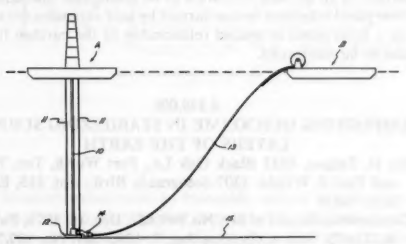
CONNECTION OF UNDERWATER LINES

Charles D. Morrill, Bellaire, Tex.; John M. Des Lierres, Rolling Hills, and Louis E. Copeland, Garden Grove, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 27, 1978, Ser. No. 973,619

Int. Cl.³ F16L *1/04;* **E21B** *33/035*

U.S. Cl. 405—169 **30 Claims**



1. Apparatus for anchoring an underwater flowline to an underwater production unit in alignment with an inboard hub on said production unit, comprising

a lockdown structure attached to the end of said flowline,

an outboard hub on the end of said flowline attached to said lockdown structure,

a bull nose removably attached to said lock-down structure, and

a pull-in tool removably attached to said production unit, said pull-in tool comprising

a latch engageable with said bull nose,

a pulling cable extending through said latch havig one end connectable to said bull nose and the other end connected to pulling means,

an alignment device rigidly and fixedly mounted on said pull-in tool and having a central axis parallel to and a predetermined distance above the flow axis of the inboard hub,

said alignment device including means engageable with said lockdown structure for rotation thereof, without axial movement, about said central axis to position the outboard hub in approximate coaxial alignment with the inboard hub, and

means engageable with said lock-down structure for pivoting said lock-down structure to vertical alignment with the inboard hub whereby said outboard hub is coaxial and in vertical alignment with the inboard hub.

4,329,086

METHOD FOR LAYING AN UNDERWATER PIPE TO STRADDLE AN ALREADY LAID PIPE, AND THE RELATIVE DEVICES

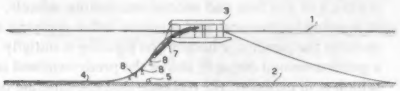
Giovanni Rosa, and Ambrogio Scodino, both of S. Donato Mi, Italy, assignors to Saipem S.p.A., Milan, Italy

Filed May 23, 1980, Ser. No. 152,763

Claims priority, application Italy, Jun. 20, 1979, 23746 A/79

Int. Cl.³ F16L *1/04*

U.S. Cl. 405—171 **8 Claims**



1. An improved method for launching and buoying an underwater pipe to straddle obstacles which must not suffer damage, such as other laid pipe or underwater cable, which utilizes a series of trestles of initially increasing and then decreasing height for straddling the pipe, comprising:

connecting the appropriate trestle to a section of the pipe by flexible means which allows the trestle to be suspended below and separate from the pipe section so as to be able to move vertically, longitudinally and transversely relative thereto;

launching the trestles and pipe and lowering them to the sea bed with the connected pipe above and separated from the trestle by the flexible means so that the trestle can be moved independently of the pipe for proper positioning of the trestle on the sea bed adjacent to the obstacle; and

allowing the descending pipe to be halted and supported by the properly positioned trestles for straddling the obstacle.

4,329,087

EXCAVATING AND PIPELINE INSTALLATION SYSTEM

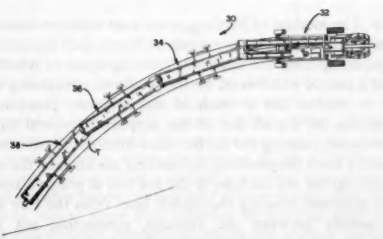
Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Continuation of Ser. No. 909,002, May 24, 1978, Pat. No. 4,232,982, which is a division of Ser. No. 683,970, May 6, 1976, Pat. No. 4,116,014. This application Mar. 5, 1979, Ser. No. 17,496

The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.

Int. Cl.³ E02F *5/10;* **F16L** *1/02*

U.S. Cl. 405—179 **14 Claims**



1. In an excavating and pipeline installation system, apparatus for receiving a pipeline strung along a predetermined course and for installing the pipeline in a pipeline receiving trench extending at a predetermined depth beneath the predetermined course including:

a vehicle adapted for movement over the surface of the earth;

excavating means mounted on the vehicle for continuously forming the pipeline receiving trench;

a pipeline bolster mounted on the vehicle a predetermined distance above the predetermined course for receiving and supporting the pipeline; and

at least one pipeline roller mounted on the vehicle for receiving the pipeline from the pipeline bolster and for exerting a downward force on the pipeline;

said excavating means comprising first and second excavating wheels mounted for rotation about angularly disposed axes and for engagement with material to be excavated, the pipeline bolster being positioned between the upper portions of the first and second excavating wheels;

said pipeline bolster and said pipeline roller applying a moment to the pipeline whereby the pipeline is initially lifted a predetermined distance above the predetermined course which is in excess of the distance that the pipeline bolster is positioned above the predetermined course and thereby substantially reducing the distance that is required in order to fully seat the pipeline in the pipeline receiving trench.

4,329,088

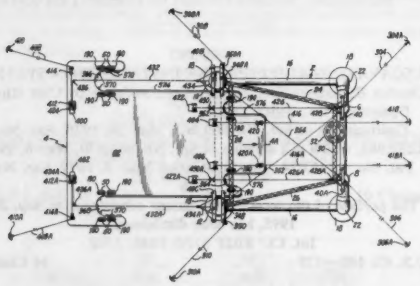
TILT-UP/JACK-UP OFF-SHORE DRILLING APPARATUS AND METHOD

Joseph E. Lucas, Houston, Tex., assignor to Marine Engineering Company, C.A., Caracas, Venezuela

Division of Ser. No. 899,391, Apr. 24, 1978. This application Jul. 31, 1979, Ser. No. 62,537

Int. Cl.³ E02B *17/04*

U.S. Cl. 405—196 **6 Claims**



1. The method of berthing a buoyant platform relative to a bottomed support having a pair of fore and aft upright caisson legs, comprising the steps of: mounting a pair of winches fore and a pair of winches aft on the platform; connecting one end of an anchor line to each of said winches; positioning the platform off the aft end of the support in general alignment therewith; running the anchor lines from the aft winches rearwardly from the platform, connecting sea anchors thereto, and lowering the sea anchors to the sea bed at points distant from the platform; running the anchor lines from the fore winches forwardly between the caissons, connecting sea anchors thereto, and lowering the sea anchors to the sea bed at points distant from the fore caissons; operating the winches to take up the anchor lines so as to align the platform for entry between the caissons; and taking up the fore anchor lines to move the platform forwardly relative to the support while correspondingly paying out the aft anchor lines.

4,329,089

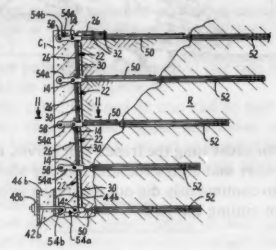
METHOD AND APPARATUS FOR RETAINING EARTHEN FORMATIONS THROUGH MEANS OF WIRE STRUCTURES

William K. Hilfiker; Harold O. Hilfiker, and William B. Hilfiker, all of Eureka, Calif., assignors to Hilfiker Pipe Company, Eureka, Calif.

Filed Jul. 12, 1979, Ser. No. 56,826

Int. Cl.³ E02D *5/20, 29/02*

U.S. Cl. 405—262 **20 Claims**



1. A retaining wall structure comprising, in combination: an anchor member for embedment in an earthen formation to be reinforced; a retention structure secured to said anchor member for extension across the face of an earthen formation to be reinforced; an extension secured relative to said anchor member and disposed outwardly of the retention structure for embedment in a concrete wall cast in place externally of the surface of an earthen formation to be reinforced; and concrete form panel retention means carried by said extension for securing a form panel in spaced relationship to the earthen formation to be reinforced.

4,329,090

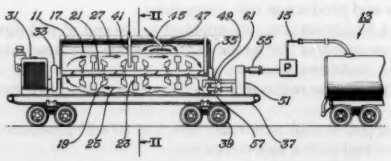
EMPLOYING QUICKLIME IN STABILIZING SURFACE LAYERS OF THE EARTH

Joe D. Teague, 4813 Black Oak La., Fort Worth, Tex. 76114, and Paul J. Wright, 1207 Sotogrande Blvd., Apt. 315, Euless, Tex. 76039

Continuation-in-part of Ser. No. 969,421, Dec. 14, 1978, Pat. No. 4,233,015. This application Jan. 7, 1980, Ser. No. 109,791

Int. Cl.³ E02D *3/14*

U.S. Cl. 405—263 **7 Claims**



1. A method of treating top surface layers of the earth for forming a stabilized base of controlled strength, movement and water permeability comprising the steps of:

a. admixing in a slurry mixing tank unslaked lime called quicklime and water to form a hot hydrated lime slurry at elevated temperature above ambient; and

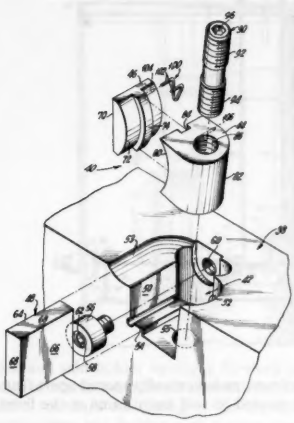
b. working the hot hydrated lime slurry before said hot hydrated lime slurry cools below ambient temperature and while said hot hydrated lime slurry is at a temperature above ambient into the top surface layers of the earth such that for the first time it is economically feasible that said surface layers are treated in situ with a hot lime slurry to obtain the desired strength and stabilization to allow stabilization even when the ambient temperature decreases to 40° F. and lower.

4,329,091

FLOATING WEDGE FOR USE IN CONJUNCTION WITH AN INDEXABLE CUTTING TOOL

Donald S. Erkfritz, Clarkston, Mich., assignor to General Electric Company, Columbus, Ohio

Filed May 7, 1980, Ser. No. 147,540
Int. Cl.[3] B26D 1/12
U.S. Cl. 407—41 10 Claims



1. In combination with an indexable cutting tool having at least one insert pocket formed therein, with said insert pocket having opposed leading and trailing walls and with said trailing wall having an arcuate configuration, a floating wedge for securely mounting an indexable cutting insert in said insert pocket comprising:

a main body member having opposed leading and trailing surfaces wherein said trailing surface of said main body member has an arcuate configuration complementary to said trailing wall of said insert pocket thereby enabling relative slidable movement between said main body member and said trailing wall of said insert pocket, with said movement being about a first predetermined axis of rotation relative to said trailing wall of said insert pocket such that the orientation of said floating wedge relative to the trailing wall of said insert pocket may be adjusted, and with said leading surface of said main body member being arcuate about a second axis of rotation which is perpendicular to the first axis of rotation of the arcuate trailing surface of said main body member; and

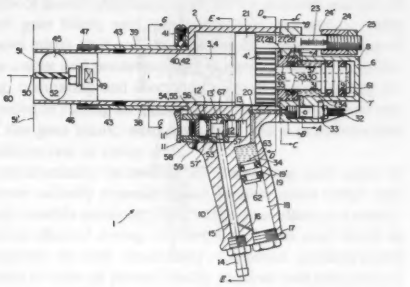
a swivel plate member having opposed leading and trailing surfaces with the trailing surface of said swivel plate member having an arcuate configuration that is complementary to the arcuate configuration of the leading surface of the main body member thereby enabling slidable movement between the trailing surface of said swivel plate member and the leading surface of said main body member about said second axis of rotation means for moving said wedge into clamping engagement with said insert and said trailing pocket wall.

4,329,092

HAND DRILL

Werner Pönitzsch, Friedrichshafen; Helmut Reccius, Munich, and Herbert Fehlings, Eltville, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Fed. Rep. of Germany

Filed Feb. 29, 1980, Ser. No. 125,862
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907913
Int. Cl.[3] B23B 39/10, 47/22
U.S. Cl. 408—11 6 Claims



1. In a hand drill with a pneumatically-hydraulically controlled advance and including a housing, a drilling drive unit adapted to be powered by compressed air and being displaceably guided in said housing by a piston and cylinder, and further including hydraulic lines, and control valves,

the improvement which comprises a rotatable support sleeve means secured to said housing and adapted to rest on the surface of a workpiece and surround a drill bit,

said piston being a double-faced hollow advance piston means mounted in said cylinder so as to divide said cylinder into two chambers, one chamber together with one face of the advance piston means being connected by conduit means to be acted on by the compressed air, and the other chamber being adapted to be filled with hydraulic fluid and pressure-loaded by the other face of the advance piston means, said other chamber communicating through hydraulic line means and a throttling back-pressure valve means with a cylinder means having a compensating piston means therein dividing said cylinder means into two chambers, one chamber together with one face of the compensating piston means being adapted to be acted on by the hydraulic fluid, and the other chamber together with the other face of the compensating piston means being connected by a pneumatic line to be acted on by the compressed air, said cylinder means being positioned in hand grip means connected to said housing,

said advance piston means on one cylinder side being adapted to displace the hydraulic fluid against said compensating piston means thus pressure-loaded until a drilling depth adjusted by a limiter means mounted on said housing is attained or until a continuously adjustable switch means mounted in said pneumatic line is deactivated, said continuously adjustable switch means being adapted to be manually actuated, being turned off automatically by pneumatic control pressure independently of manual actuation when the desired depth of drilling is attained and including a manually actuated release means and a valve piston means, said release means and valve piston means being held together by force applied until the valve piston means overcomes the control pressure built up by a limiter means and resistance of a ball latching means for the actuated release means, and returns to a closed position determined by stop means,

whereby the pressure acting on the compensating piston means returns the drilling drive unit together with the advance piston means to the initial position thereof.

4,329,093

DIE-HEAD OF CUTTING MACHINE

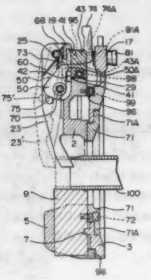
Masaaki Maruyama, 8-3, Koaza Sanbongi, Aza Inuidani, Seika-cho, Soraku-gun, Kyoto, Japan

Filed Feb. 19, 1980, Ser. No. 122,459

Claims priority, application Japan, Mar. 14, 1979, 54-31635[U]

Int. Cl.³ B23G 5/12

U.S. Cl. 408—15 2 Claims



1. A die-head of a cutting machine comprising a pair of relatively rotatable annular plates which movably hold cutting tools therebetween, so that said cutting tools can be radially displaced by the relative rotation of said annular plates, a tool retracting lever with a stop, said lever projecting at one end thereof into a center opening of said annular plates, for engagement with a free end of a workpiece said lever being pivotally connected to one of said annular plates with a return spring being provided between said lever and said one annular plate, a slide which is integrally connected to the other annular plate so as to move therewith and which is always pressed in a peripheral direction of said annular plates by a spring arranged between said slide and said one annular plate, said slide being mounted to said one annular plate, and a cam plate with a projection which bears against said stop, said cam plate being pivotally mounted to said one annular plate, said slide being provided with a recessed groove which receives said projection of said cam plate therein, whereby the displacement of said tool retracting lever, which occurs when said tool retracting lever is pushed and pivoted by a free end of a workpiece moving through said center opening, causes said cam plate to rotate in order to disengage the projection of said cam plate from said recessed groove of said slide, thus resulting in a rotation of the slide together with said other annular plate to automatically retract said cutting tools.

4,329,094

BORING AND FACING APPARATUS FOR USE INSIDE A LARGE VESSEL

Edmund A. Cooley, Scotia, N.Y.; Robert Long, Tinley Park, Ill., and Phillip D. Ness, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,740

Int. Cl.² B23B 41/00

U.S. Cl. 408—77 9 Claims

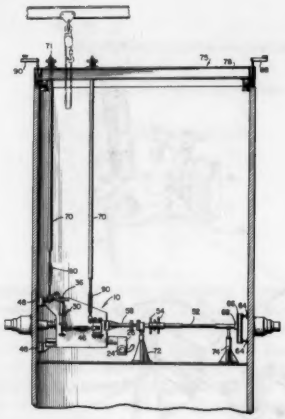
1. Apparatus for machining a feedwater nozzle of a reactor vessel including a cylindrical sidewall member, a floor member at one extremity of said cylinder wall and a peripheral area at the top and at the other extremity of said cylinder wall, and said cylindrical sidewall member including sparger brackets substantially equally spaced on opposite sides of said feedwater nozzle, comprising:

(a) a main frame, having a base, sidemembers, a front end and a back end;

(b) means for suspending said main frame from a support structure to be supported upon the peripheral area of said cylinder wall;

(c) said means for suspending said main frame including means for adjusting the vertical distance of said main frame below said support structure;

(d) a pair of outriggers extending from said main frame on opposite sides thereof and including means for coupling each of said outriggers to one of the said spaced apart sparger brackets;



(e) a first pair of nose pads vertically spaced apart from one another and secured to said main frame at the front end thereof;

(f) a second pair of nose pads vertically spaced apart from one another and means coupling said second pair nose pads to the back end of said main frame;

(g) a boring machine slideably moveable on said main frame; and

(h) means for adjusting the position of said boring machine respective the center line of a feedwater nozzle in three planes perpendicular one to the other.

4,329,095

POSITION INDICATOR FOR A MANUALLY OPERATED APPARATUS

Peter Schmuck, Mauren, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaand Furstentum, Liechtenstein

Filed Jul. 1, 1980, Ser. No. 165,146

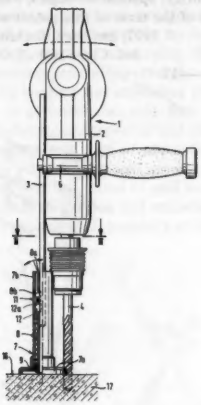
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2929073

Int. Cl.³ B23B 39/00, 49/00

U.S. Cl. 408—112 7 Claims

1. Manually operated apparatus for driving a member such as a tool or fastening element along a drive axis into a receiving material including a manually operated device for driving the member along the drive axis into the receiving material and means attached to said device for providing a visual indication of the angular disposition of the drive axis of the member relative to the surface of the receiving material into which it is being driven for positioning the member perpendicularly to the surface of the receiving material, wherein the improvement comprises a base arranged to be supported on the surface of the receiving material adjacent the location at which the member is to be driven into the receiving material, means attached to said device and connected to said base for affording an indication of the angular disposition of the drive axis of the member being driven by said device relative to the surface of the receiving material into which it is to be driven, said means being pivotally supported on said base for affording the visual indication of the angular disposition of the drive axis and for position-

ing the drive axis perpendicularly to the surface of the receiving material, said means comprises an axially elongated holder spaced laterally from and extending parallel with the drive axis of said device, said holder being pivotally mounted relative to said supporting base and being slidably displaceable in the axial direction relative to said device, each of said supporting base and said holder being coextensive and extending in the axial direction of the drive axis of said device, each of said support-



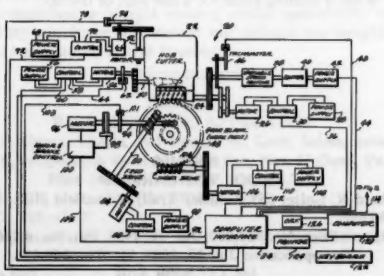
ing base and said holder having a forward end facing in the direction in which a member is driven into the receiving material and a rearward end facing in the opposite direction, said supporting base and holder each having swivel bearing surfaces in contact with one another and located adjacent the forward end of each, and the rearward end of said supporting base and of said holder each terminate in approximately the same plane extending transversely of the drive axis of said device.

4,329,096

GEAR CUTTER

Saul Herscovici, Waterloo, Iowa, assignor to Power Engineering and Manufacturing, Ltd., Waterloo, Iowa

Filed Jan. 24, 1979, Ser. No. 6,226
Int. Cl.³ B23F 5/20
U.S. Cl. 409—15 **25 Claims**



1. A method of cutting gears of increased accuracy comprising:

(a) cutting a gear blank with an electrically activated variable speed cutter having an electrically activated means for providing a variable speed cutter shift;

(b) measuring the units of power actually expended in the operation of said electrically activated variable speed cutter;

(c) employing an electrically activated variable speed means for providing the workpiece feed of said gear blank;

(d) electronically comparing and correlating said units of power actually expanded with a predetermined value of units of power ideally required for the material and size of said gear blank, said workpiece feed and said variable speed cutter shift and the new or sharpened condition of the cutter said predetermined value obtained by calculating, comparing and recording units of power ideally expended in cutting an ideal gear given the material and size of the gear blank, workpiece feed and a predetermined uniform rate of cutter shift;

(e) electronically increasing or decreasing said units of power actually expended, said variable speed cutter shift said variable workpiece feed of the gear blank or a combination thereof during the cutting of said gear blank in response to said electrically compared predetermined value of units of power ideally required and said units of power actually expended to provide the necessary chip removal to duplicate said ideal gear.

15. A gear cutting machine comprising:

(a) a workpiece support, said workpiece support including a first electrically controlled variable speed electric motor for providing variable workpiece feed and impulses corresponding to workpiece feed;

(b) driving means wherein said driving means comprises a second variable speed electric motor for driving an electrically activated variable speed cutter said driving means further including a third electrically activated variable speed motor for varying the shift of said variable speed cutter including a cutter support providing separate cutter rotation drive and cutter shift displacement drive and wherein said second variable speed electric motor is operatively connected to said cutter rotation drive and said third electrically activated variable speed motor is operatively connected to said cutter shift displacement drive;

(c) an electrical controller for measuring and providing impluses of increases and decreases in drive power utilized in operating said second variable speed electric motor and for increasing or decreasing the speed of said first and said third variable speed electric motors;

(d) an electrical central processing unit for receiving and comparing said impluses received from said controller with predetermined values from a main memory unit of the computer and generating corrective power impulses for said second variable speed electric motor or for increasing the speed of said third variable speed electric motor; and

(e) a computer having a main memory unit with predetermined value of units of power ideally required for the material and size of the gear blank, workpiece feed and said shift of said variable speed shift to provide signals to said electrical central processing unit for computing the necessary change or changes in power for driving said electrically activated cutting element and for increasing or decreasing the speed of said third variable speed electric motor and providing corrective impulses to said electrical controller wherein said computer main memory unit in combination with said central processing unit varies said power for said first variable speed motor and varies the speed of said third variable speed motor in response to a

detected change in the power utilized for driving said second motor within the response time of the computer and the electrical circuits that is accomplished within millionths of a second to provide the necessary changes in drive power and cutter shift during the cutting of the gear blank to duplicate a previous gear cutting operation.

4,329,097

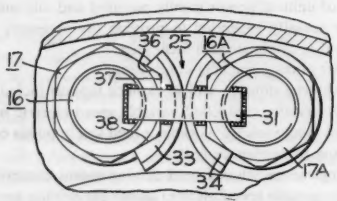
ADJUSTABLE POSITIVE MEANS FOR LOCKING STUDS AND NUTS HAVING CRITICAL PRESTRESS VALUE

Robert D. Steele, and Duane E. Doll, both of York, Pa., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 15, 1980, Ser. No. 150,155

Int. Cl.³ F16B *39/02*

U.S. Cl. 411—88 **2 Claims**



1. An adjustable and positive locking means for locking studs and associated hex-nuts having critical prestress value comprising;

a stud locking bar constructed and arranged to extend between two adjacent studs in a manner that the ends of said bar rest upon the exposed ends of the two adjacent studs;

means to secure said locking bar to the ends of the studs to form a positive lock between the studs;

a first nut locking cup engageable with a hex-nut on one of the studs;

a second nut locking cup engageable with the hex-nut on the other of the studs;

means to secure said first and second nut locking cups to said locking bar to prevent rotation of the stud nuts;

wherein said first and second nut locking cups are identical and each is constructed with concave internal surfaces that closely engage with hex surfaces on the associated stud nut; and

wherein each of said nut locking cups are constructed with an outside radius that is equal to one-half the distance between the associated adjacent studs so that the outside surfaces of the nut locking cups will remain in contact with each other regardless of the angular relationship of the hex-nuts.

4,329,098

Patent Not Issued For This Number

4,329,099

SELF-DRILLING AND SELF-EXTRUDING FASTENER

Mituo Shimizu, and Hidenori Miyake, both of Kyoto, Japan, assignors to Kabushiki Kaisha Yamashina Seikosho, Kyoto, Japan

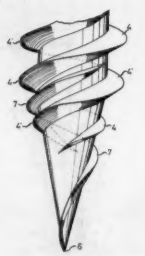
Continuation-in-part of Ser. No. 14,919, Feb. 26, 1979, Pat. No. 4,241,638, which is a continuation of Ser. No. 806,450, Jun. 14, 1977, abandoned. This application Jan. 17, 1980, Ser. No. 113,049

Claims priority, application Japan, Feb. 23, 1977, 52-18048

The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.

Int. Cl.³ F16B *25/00*

U.S. Cl. 411—412 **9 Claims**



1. An integral self-drilling and self-extruding screw fastener comprising,

a cylindrical shank having at one end means for engaging a rotary driving tool and the other merging into a tapering tip ending in a point,

the shank having formed on its outer surface a tapping screw thread of a selected outside diameter, root diameter and tapping pitch,

said tapping screw thread continuing from the shank for a minor part of the length of the tip with its height gradually reducing just beyond the zone of merger of the shank and tip until said screw thread disappears on said tip,

a single drilling thread generated in a position substantially within said merger zone of the shank and tip and continuing on said tip to the point,

said drilling thread first having an extruding pitch the same as that of said tapping screw thread for a minor part of the length of the tip and gradually increasing in height and then having its height and its root diameter reduced and its lead angle greatly increased as it nears the point whereby it has a drilling pitch for a last part of the tip.

4,329,100

ROOF TOP CARRIER

Richard R. Golze, 637 Kingsley Trail, Bloomfield Hills, Mich. 48013

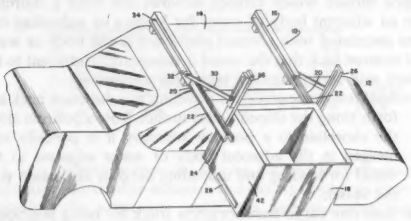
Division of Ser. No. 926,940, Jul. 21, 1978, Pat. No. 4,260,314. This application Jul. 17, 1980, Ser. No. 169,611

Int. Cl.³ B60R *9/04*

U.S. Cl. 414—21 **1 Claim**

1. A roof top carrier for vehicles comprising a frame to be supported by the roof of a vehicle, transport means supported by said frame, a housing supported by said transport means for

transporting said housing away from its stored position on said roof down to the side of said vehicle to its loading and unloading position and back again to said stored position without any substantial change of the vertical or horizontal orientation of said housing, said transport means includes first and second telescoping slidable arms, said first telescoping slidable arms are slidably received and horizontally supported by said frame by bearings for transporting said housing generally horizontally away from said stored position on said roof of said vehicle, said second telescoping slidable arms are slidably received and vertically supported by a frame member by bearings, said frame member carried by said first telescoping slidable arms for transporting said housing generally vertically down to the side of said vehicle to its loading and unloading position, first travel limiting means is provided on said first telescoping slidable arms to limit the horizontal travel of said housing away from said stored position on said roof of said vehicle, second travel limiting means is provided on said second telescoping slidable arms to limit the vertical travel of said housing down to the side of said vehicle to its loading and unloading position, said frame comprises a plurality of members at least two of



which members are substantially parallel to each other and are positioned on said roof perpendicular to the longitudinal axis of said vehicle, there being one each of said parallel members fore and aft of said housing when it is in its stored position, said first telescoping slidable arms include telescoping slidable arms received within said parallel frame members, said parallel frame members being generally horizontal with respect to said vehicle roof, there are at least two first telescoping slidable arms telescopingly received within each said parallel frame member, at least one of said first telescoping slidable arms is horizontally fixedly attached to said housing, said horizontally fixedly attached telescoping slidable arm being horizontally slidably removable from said other telescoping slidable arm received within said parallel frame members, said housing being free to be transported generally vertically downwardly by said second telescoping slidable arms to the side of said vehicle to its loading and unloading position when said horizontally fixedly attached telescoping slidable arm is so removed from said other telescoping slidable arms, the improvement comprising a weight sensing means operatively supported by said frame to measure and indicate the weight of objects being stored in said housing.

4,329,101

BALE HANDLING APPARATUS

Allen P. Green, Visalia, and Donald M. Grey, Selma, both of Calif., assignors to Sperry Corporation, New Holland, Pa.

Filed Jun. 20, 1980, Ser. No. 161,719
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—24.5 **10 Claims**

1. Apparatus for picking up, transporting and dumping round bales, comprising:

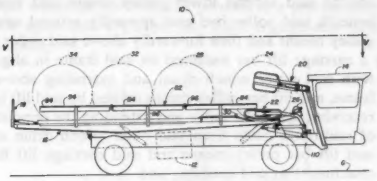
(a) a bed,

(b) a bale retainer connected to said bed, said retainer having a first portion and a second portion spaced from said first portion;

(c) means for picking up a first bale and depositing said first bale on said bed in a first position of a first row in engagement with said first portion of said retainer, said means for picking up being at a first end of said bed;

(d) means for urging said first bale in engagement with said retainer from said first position to a second position of said first row;

(e) said means for picking up said first bale, also picking up a second bale and depositing said second bale in said first position of said first row in engagement with said first portion of said retainer,



(f) means for simultaneously urging said first and second bales from said first row to a second row on said bed into engagement with said second portion of said retainer; and

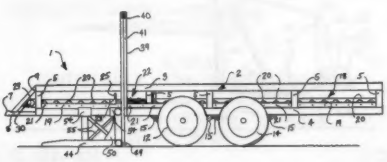
(g) a gate connected to a second end of said bed, said gate being pivotal between a first position retaining said bales on said bed during picking up and transporting, and a second position permitting said bales to be dumped from said bed, said bed being pivotal between a first position supporting said bales during picking up and transporting, and a second position wherein said first end is raised to a position higher than said second end during dumping.

4,329,102

AUTOMATIC BALE WAGON

John H. Gray, Rte. 1, Box 51, Keatchie, La. 71046

Filed Sep. 8, 1980, Ser. No. 185,315
Int. Cl.³ A01D *87/12*; B60P *1/48*
U.S. Cl. 414—24.5 **11 Claims**



1. An automatic bale wagon for towing by a vehicle and for loading, transporting and unloading round bales of hay comprising:

(a) a wagon frame;

(b) at least one set of wheels carrying said frame;

(c) a roller bed mounted in said frame and extending substantially the entire length of said frame;

(d) bale-engaging carriage means pivotally attached to one side of said frame and extending outwardly of said frame;

(e) winch means mounted on the opposite side of said frame from said carriage means and provided with outer, middle and inner winch drums journalled for rotation in said winch means;

(f) an outer cable having one end wound on said outer winch drum; a middle cable having one end wound on said middle winch drum in the same direction as said outer cable, and an inner cable having one end wound on said inner winch drum in the opposite direction from said outer cable and said middle cable;

(g) first lower pulley means disposed opposite said middle winch drum and beneath said roller bed on said frame, and forward pulley means cooperating with the forward end of said frame for receiving said middle cable and extend-

ing the opposite end of said middle cable from said middle winch drum, around said first lower pulley means and forward beneath said roller bed and upwardly around said forward pulley means and then rearwardly above said roller bed;

(h) second lower pulley means disposed opposite said inner winch drum and beneath said roller bed on said frame, and rear pulley means mounted on the rear end of said frame, for receiving said inner cable and extending the opposite end of said inner cable from said inner winch drum, around said second lower pulley means and rearward beneath said roller bed and upwardly around said rear pulley means and then forwardly above said roller bed;

(i) a carriage lift bar mounted on said frame in alignment with said outer winch drum and extending above said frame, and lift bar pulley means carried by said lift bar for receiving said outer cable and extending the opposite end of said outer cable from said outer winch drum around said lift bar pulley means and said carriage lift bar for attachment to said carriage; and

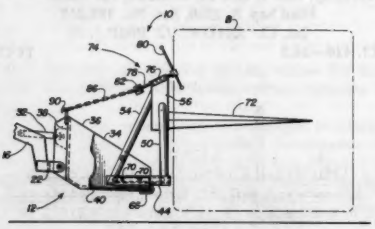
(j) upward standing rake means slidably carried by said roller bed and attached to said opposite end of said middle cable on the front side of said rake means, and attached to said opposite end of said inner cable on the rear side of said rake means for causing said rake means to traverse said roller bed responsive to activation of said winch and winding of said middle cable and said inner cable in opposite directions on said middle winch drum and said inner winch drum, respectively.

4,329,103

BUCKET LOADER ATTACHMENT

Lester E. Miller, Rte. #1, Box 333, Hegins, Pa. 17938

Filed Sep. 24, 1980, Ser. No. 190,343
Int. Cl.³ E02F *3/80*
U.S. Cl. 414—24.5 **12 Claims**



1. A bucket loader attachment adapted to be releasably secured to a bucket of a front end loader, said bucket having a floor and an upper portion, said attachment comprising:

(a) a generally upright frame structure having a lower rectangular base portion adapted to rest on the floor of the bucket;

(b) a load support member mounted on an upper portion of said frame structure and extending forwardly therefrom for supporting a load on said front end loader;

(c) means along said base portion for releasably receiving the forward edge of the floor of said bucket;

(d) flexible link means interconnecting said upper portion of said frame structure with said upper portion of said bucket; and

(e) tension means connecting said link means and one of said upright frame structure or said bucket for adjusting tension in said link means so as to firmly anchor a rear edge of said base portion of said frame structure on the floor of said bucket such that said load support member acts as an integral extension of said bucket and such that when said attachment is releasably secured on said bucket, said flexible link means takes on a V-shaped configuration with its vertex being connected to said tension means and with its legs being attached to transversely spaced locations on said upper portion of said bucket.

4,329,104

CARGO HANDLING APPARATUS

Seiji Akiyama, Yokohama; Mamoru Kurihara, Koganei, and Kazuhiko Ueki, Mitaka, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1979, Ser. No. 74,403
Int. Cl.³ B63B *27/00*
U.S. Cl. 414—139 **10 Claims**

1. A cargo handling apparatus used on a wharf having a sloped surface which extends downwardly from a shoreline into an adjacent body of water for loading or unloading cargoes associated with a vessel positioned in the body of water and moored such that the vessel is substantially adjacent to the wharf, said cargo handling apparatus comprising:

at least one crane truck for traveling in a direction back and forth along the sloped wharf surface from a position along the shoreline to a position whereby it is partially submerged in the adjacent body of water adjacent to the vessel for loading and unloading cargoes associated with the vessel;

at least one cargo transportation truck for being positioned along the shoreline and for traveling back and forth in a direction that is substantially parallel and adjacent to the traveling direction of said crane truck and for, when said crane truck is adjacent the vessel, being juxtaposed next to said crane truck for allowing said crane truck to load cargoes from the vessel thereon and for allowing said crane truck to unload cargoes thereon onto the vessel, and

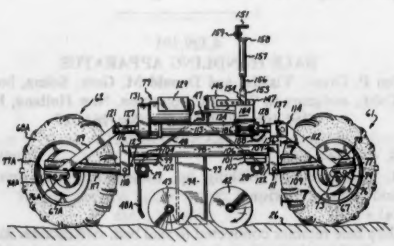
a shore crane positioned on the shoreline and operatively associated with said cargo transportation truck for, when said cargo transportation truck is positioned along the shoreline, loading cargoes therein and unloading cargoes therefrom.

4,329,105

SILO UNLOADER LEVELING APPARATUS

Floyd E. Buschbom, Long Lake; Glen D. Hansen, Maple Plain; Jerome T. Paulson, Long Lake, and Clifton W. Anderson, Wayzata, all of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Apr. 30, 1979, Ser. No. 34,863
Int. Cl.³ B65G *65/38*
U.S. Cl. 414—316 **49 Claims**



33. A leveling control means for a top unloading silo unloader including a material collector having an outer end, and

means for supporting the collector in a silo comprising: first means for sensing a change in a selected operating position of the collector, and second means mounted on the collector and connected to the means for supporting the collector in the silo for leveling the collector in the selected operating position in response to operation of the first means, said second means having lost motion means operable to maintain the means for supporting the collector in an operative position during the operation of the second means, said lost motion means including a member having an elongated slot, pivot means located in the slot, and biasing means cooperating with the member and pivot means to urge the means for supporting the collector to said operative position.

4,329,106

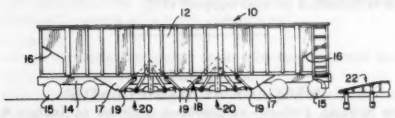
HOPPER CAR DISCHARGE GATE OPERATING MECHANISM

Franklin P. Adler, 105 Boyd Cir., Michigan City, Ind. 46360

Continuation of Ser. No. 871,640, Jan. 23, 1978, abandoned. This application Aug. 20, 1979, Ser. No. 67,629

Int. Cl.³ B65G *67/00*

U.S. Cl. 414—388 **8 Claims**



1. In a railway hopper car having hoppers for transporting and storing particulate material, and having discharge gates for unloading the particulate material, a gate operating mechanism, the improvement comprising:

pivoted discharge gate means movable from a first, closed position to a second, open position;

a linkage mechanism;

said linkage mechanism having a pivoted actuating member with means extending outwardly of the railway hopper car;

said means extending outwardly of the hopper car including means engageable with trackside means for opening said discharge gate;

said means extending outwardly of the railway vehicle including roller means and support arm means therefor;

said support arm means for the roller means comprising an arm with pivot means connecting with the actuating member;

said support arm means also including a lock for releasably attaching the support arm to said actuating member;

a toggle link means with a first pivot means pivotally connecting with the actuating member and second pivot means pivotally connected with said discharge gate means;

gate return means for moving the hopper gate from the second or open position to the closed position.

4,329,107

WIRE ROPE SPARE TIRE CARRIER

Lindel F. Smith, Rte. 4, Box 410, Seminole, Okla. 74868

Filed Jan. 21, 1980, Ser. No. 114,065

Int. Cl.³ B62D *43/04*

U.S. Cl. 414—463 **5 Claims**

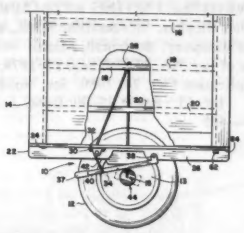
1. A vehicle spare tire carrier comprising

a first pulley securable to the vehicle adjacent the storage position of the tire;

a second pulley securable to the vehicle and spaced from the first pulley;

an elongated lever arm having one end pivotally secured to the vehicle, the pivot point thereof being spaced from the second pulley and having axis of rotation parallel to the axis of rotation of the second pulley, a cable attachment point on the lever arm spaced from the pivot point, wherein the second pulley is located at a higher level than the lever arm pivot point, the cable attachment point being on the upper side of the lever arm whereby said cable member may be rotated fully past the lever arm pivot point;

a flexible cable extending from the attachment point on the lever arm, around both pulleys and terminating with a spare tire carrier bracket, the length of the cable being such that when the lever arm is fully pivoted in a first direction, the spare tire may be removed from the vehicle and when the lever arm is pivoted in a second direction the spare tire is pulled into tight engagement with the vehicle;



a stop member carried by the vehicle to prevent rotation of the lever arm beyond a locked position in the second direction, the relative positions of the second pulley, the lever arm pivot point and the stop member being such that when the lever arm is in the locked position, the cable extending from the cable attachment point to the second pulley is offset from the lever arm pivot point whereby tension in the cable tends to keep the lever in its locked position against the stop member;

wherein the first pulley is positioned under the bed of the pickup truck and the second pulley is carried by the mid-portion of the bumper of the vehicle, the outer end of the bumper serving as the stop member, the lever arm pivot point being spaced rearwardly of a line connecting the stop member and the second pulley.

4,329,108

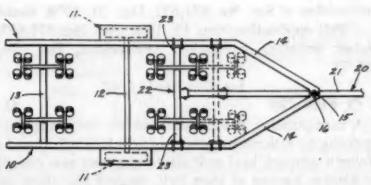
ADJUSTABLE LENGTH BOAT TRAILER

Byron L. Godbersen, R.R., Ida Grove, Iowa 51445

Filed Jun. 15, 1979, Ser. No. 48,976

Int. Cl.³ B60P *3/10*

U.S. Cl. 414—534 **4 Claims**



1. A boat trailer comprising:

frame means including a pair of integral side frame members each having a straight portion and an angled portion, said frame members disposed such that said straight portions are parallel and said angled portions converge toward each other, the forward ends of said angled portions spaced from each other, a stationary brace extended across and interconnecting the rear ends of said straight portions;

wheel means connected to said straight portions of said frame means;

tongue means including a movable brace disposed parallel to said stationary brace the ends of which are releasably clamped to said straight portions, said tongue means including further an elongated tongue member secured at its rear end to the center of said movable brace and extended forwardly between said angled portions spaced ends;

means releasably clamping said spaced ends to said tongue member; and

boat supporting means including a plurality of units one or more of which is mounted on said stationary and movable braces.

4,329,109

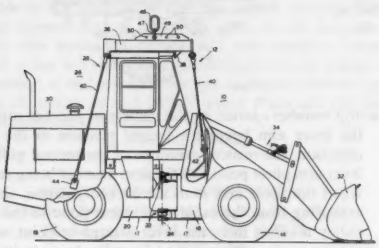
VEHICLE LIFTING ATTACHMENT

Joseph R. Den Bleyker, Stevensville, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 75,859, Sep. 17, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 197,056

Int. Cl.³ B60R *27/00*; B66C *1/20*

U.S. Cl. 414—685 **5 Claims**



1. A lifting attachment for a vehicle having a frame and a superstructure on the frame including an operator's compartment, comprising a horizontally disposed multilateral lift frame resting on the operator's compartment during normal vehicle operation, a lifting eye connected to said lift frame and located approximately over the center of mass of the vehicle, and at least three flexible cables connected between said lift frame and the vehicle frame.

4,329,110

MANIPULATING DEVICE, PARTICULARLY FOR INDUSTRIAL ROBOTS

Peter Schmid, Evilard, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Biel, Switzerland

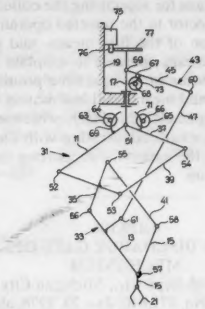
Continuation of Ser. No. 971,672, Dec. 21, 1978, abandoned. This application Aug. 12, 1980, Ser. No. 177,497

Claims priority, application Switzerland, Dec. 29, 1977, 16164/77

Int. Cl.³ B66C *1/42*

U.S. Cl. 414—730 **14 Claims**

1. A manipulating device, particularly for industrial robots, comprising an articulated gripping arm located on and extending from a support, said articulated gripping arm comprising a lever system having at least first, second and third members pivotally connected and mounted with the pivot axes parallel to each other, said first member being pivotally connected to the support, said manipulating device further comprising at least one first and one second drive unit to move said members to predetermined angular relationships with respect to the support, and at least one gripper or tool mounted on the third member, and having the improvement which consists in that the first member (**11**) forms part of a first lever parallelogram (**31**); in that the second (**13**) and third (**15**) members form part of a second lever parallelogram (**33**) having a member (**35**) in common with the first lever parallelogram (**31**), and in that two members (**11,37**) of said first lever parallelogram (**31**) have the same pivot axis (**51**) on the support (**17**) and in that said two



members (**11,37**) are in operative connection, respectively with said first and second drive units (**63,65**), each of which drive units is mounted on said support (**17**).

4,329,111

MECHANICAL MANIPULATOR

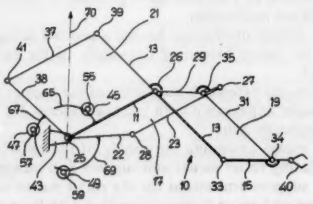
Peter Schmid, Evilard, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services, Biel, Switzerland

Filed Jun. 17, 1980, Ser. No. 160,258

Claims priority, application Switzerland, Jun. 19, 1979, 5729/79

Int. Cl.³ B25J *3/00*

U.S. Cl. 414—733 **12 Claims**



1. A mechanical manipulator comprising in combination:

a support;

first, second and third drive means located on said support;

an articulated arm assembly extending from said support, said arm assembly further comprising:

a first member pivotally connected on a first pivot axis to said support and forming part of said first lever-parallelogram having a first lever and also forming part of a third lever-parallelogram having a second lever;

a second member pivotally connected on a second pivot axis to said first member and forming part of a second lever-parallelogram;

a third member pivotally connected on a third pivot axis to said second member and also forming a part of said second lever-parallelogram;

said first drive means being operative to pivot said first member about said first pivot axis;

said second drive means being operative to pivot said second lever of said third lever-parallelogram; and,

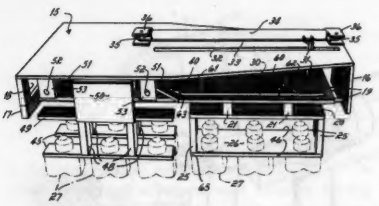
said third driving means being operative to pivot said first lever of said first lever-parallelogram so that rotation of said first and second levers through first and second angles produces rotation through the same first and second angles by said second and third members.

4,329,112

TRANSFER APPARATUS FOR PATTERN-CHANGING MECHANISM

Charles G. Glover, Cincinnati, Ohio, assignor to The Lodge & Shipley Company, Cincinnati, Ohio

Filed Apr. 16, 1979, Ser. No. 30,281
Int. Cl.[3] B65G 47/91
U.S. Cl. 414—751 5 Claims



1. In apparatus for transferring articles, a mechanism for reorienting a pattern of articles comprising,

a support,

a center carriage suspended from said support, and having transverse and longitudinal edges,

a pair of outboard carriages of substantially the same length as said center carriage, said outboard carriages being suspended from said support and, in a first position, being located adjacent each longitudinal edge of said center carriage,

means mounted on said center and outboard carriages for holding articles,

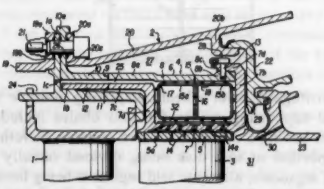
and means for moving said outboard and center carriages longitudinally with respect to each other and thereafter moving said carriages transversely with respect to each other to shift said outboard carriages from said first position to a second position in which the ends of said outboard carriages are adjacent the transverse edge of said center carriage, thereby bringing said outboard carriages into longitudinal alignment with said center carriage.

4,329,113

TEMPERATURE CONTROL DEVICE FOR GAS TURBINES

Michel R. Ayache, Epinay sous Senart; Pierre A. Glowacki, Melun, and Gerard M. F. Mandet, Epinay sous Senart, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Oct. 5, 1979, Ser. No. 82,338
Claims priority, application France, Oct. 6, 1978, 78 29080
Int. Cl.[3] F01D 11/08
U.S. Cl. 415—116 7 Claims



1. A gas turbine shroud including a casing and an abradable member mounted on an annular support, said support comprising:

a first annular shell having an interior wall portion;

a flexible annular wall interconnecting said first shell to said turbine casing;

a second shell mounted inside said first shell for bracing said first shell and for receiving compressed air so as to brace said first shell; and

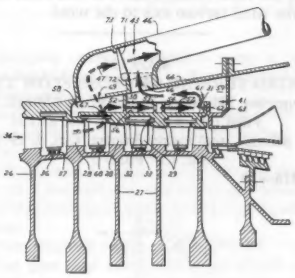
means for circulating air between said first and second shells so as to cool said first and second shells and for circulating air along said interior wall portion of said first shell onto said abradable member so as to cool said abradable member by impingement with air.

4,329,114

ACTIVE CLEARANCE CONTROL SYSTEM FOR A TURBOMACHINE

Richard P. Johnston, Morrow, Ohio; Malcolm H. Knapp, South Lynnfield, and Charles E. Coulson, Danvers, both of Mass., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 25, 1979, Ser. No. 60,449
Int. Cl.[3] F01D 25/14
U.S. Cl. 415—145 17 Claims



1. An improved clearance control system for a turbomachine including a compressor of the type having a plurality of rotor stages surrounded in close radial relationship by a stator structure, wherein the improvement comprises:

(a) means for introducing the flow of cooling air along an axial path at the outer surface of said stator structure to inhibit thermal growth thereof, said flow-introducing means including means for bleeding motive fluid from said compressor; and

(b) means for selectively diverting the flow of cooling air from said axial path during predetermined conditions of turbomachine operation, said flow-diverting means comprising an air exit duct which fluidly communicates with said flow-introducing means.

4,329,115

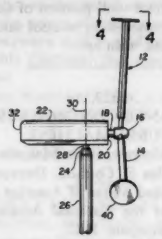
DIRECTIONALLY STABILIZED WIND TURBINE

Robert W. Kress, Lloyd Harbor, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 2, 1981, Ser. No. 230,203
Int. Cl.[3] F03D 7/04
U.S. Cl. 416—11 1 Claim

1. A wind turbine comprising an elongated pod-like body having an upwind and downwind longitudinal end, said body being pivotally mounted intermediate said longitudinal ends on a pivot on elevated structure, said pivot forming the yaw axis of said turbine, a shaft mounted for rotation on said downwind end of said body, a hub fixed on said shaft, at least one blade designed to be driven by the wind carried on said hub, a tip plate on the radially outer end of said blade, said tip plate having a surface area large enough to provide an aerodynamic force on said blade when the wind shifts away from the rotational axis of said blade whereby a restoring moment about said yaw axis to turn said turbine into the wind is provided, and wherein said restoring moment is equal to the distance of the center of pressure of said tip plate from said pivot times the lift

of said tip plate, and wherein the tip plate lift is the product of one-half the air density, the square of the wind vector relative to said blade, the area of said tip plate, the lift curve slope per



radian of said tip plate, and the angle of attack of the tip plate to the relative wind which is the inverse sine of the wind speed divided by the wind vector relative to said blade times the yaw angle of the wind turbine axis to the wind.

4,329,116

WIND TURBINE OF CROSS-FLOW TYPE

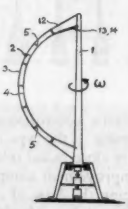
Olle Ljungström, Sälgstigen 12, S-181 62 Lidingö, Sweden

Filed Oct. 5, 1979, Ser. No. 82,154

Claims priority, application Sweden, Oct. 6, 1978, 7810504

Int. Cl.³ F03D *3/06*

U.S. Cl. 416—19 **9 Claims**



1. In a wind turbine of the cross flow type having at least one vane mounted at upper and lower ends thereof to a rotor shaft for peripheral rotation with or about said rotor shaft,

the improvement comprising:

said at least one vane being continuously curved relative to said rotor shaft between the ends of said at least one vane mounted to said rotor shaft, and said at least one vane comprising a plurality of substantially parallel blades extending in a longitudinal direction along the entire length of the vane, and

a plurality of spacing elements mounted to and disposed between said plurality of blades for spacing said plurality of blades apart from each other, said spacing elements being of a sufficient size to provide a spacing between said plurality of blades of the order of magnitude of ½ to 3 times the blade chord.

4,329,117

WIND TURBINE WITH DRIVE TRAIN DISTURBANCE ISOLATION

Glidden S. Doman, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

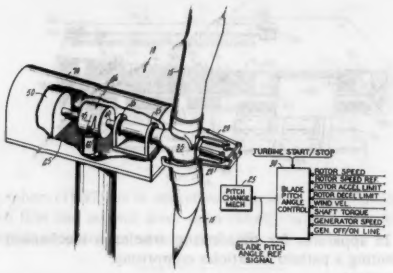
Filed Apr. 22, 1980, Ser. No. 142,783

Int. Cl.³ F03D *11/02*

U.S. Cl. 416—170 R **5 Claims**

1. A wind turbine including a drive train comprising a plurality of variable pitch airfoil blades mounted on a rotor adapted to drive a load, blade pitch being controlled by a blade pitch angle control, the output of which at high wind velocity conditions being indicative of blade pitch required for isolation of said load from drive train disturbances while maintaining a desired output power, and at marginal wind velocity conditions, being indicative of blade pitch required for maximizing rotor output power irrespective of drive train disturbances, said wind turbine further including gearing for stepping up the rotational speed of said rotor to a value compatible with the operation of said load, said wind turbine being characterized by:

resilient mounting means independent of, and unconnected



to said blade pitch angle control for resiliently mounting said gearing to said wind turbine at a non-rotatable portion thereof, thereby isolating said load from disturbances to said drive train resulting from such conditions as wind gusting, wind stream dissymmetry and inherent drive train resonances and allowing said maximization of rotor output power by said blade pitch angle control irrespective of such disturbances at said marginal wind velocity conditions.

4,329,118

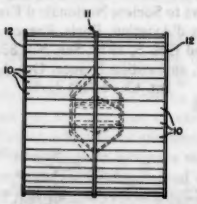
CENTRIFUGAL BLOWER WHEELS

James R. Ranz, Wilmington, Ohio, assignor to Philips Industries, Inc., Dayton, Ohio

Filed Jan. 8, 1980, Ser. No. 110,412

Int. Cl.³ F04D *29/26*

U.S. Cl. 416—178 **15 Claims**

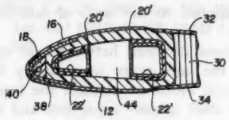


1. A centrifugal blower wheel comprising multiple blower blades, and supporting means for said blades including an annular disk having a centrally located opening therethrough, the inner portion of said disk being divided radially into a plurality of segments, alternate said segments being bent in the same direction out of the plane of said disk through an angle of less than 45° into axially overlying relation with the other said segments to provide space between the planes defined by the radially inner ends thereof and the radially inner ends of said other segments, rigid hub means mounted in said space, and means securing said hub means to the radially inner ends of all of said segments with said bent segments in bracing relation with each other and the end of said hub means secured thereto.

4,329,119
ROTOR BLADE INTERNAL DAMPER

Joseph M. Baskin, Bala Cynwyd, Pa., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 821,070, Aug. 2, 1977, Pat. No. 4,188,171.
This application May 16, 1979, Ser. No. 40,364
Int. Cl.[3] B64C *27/46*
U.S. Cl. 416—226 8 Claims



1. An aerodynamic rotor blade comprising:

(a) an elongated structural spar member having an inner surface forming a hollow interior throughout its length and a contoured outer surface forming a leading edge portion and a spar heel portion, which together define the chordwise limits of the spar member, and a tip end portion and a root end portion, which together define the spanwise limits of the spar member;

(b) an aft fairing structure attached to the spar member at the spar heel portion along the full length thereof, said aft fairing structure having a trailing edge wedge at its end remote from its attachment to the spar heel portion;

(c) a plurality of constraining members situated within the hollow interior of the spar member to form at least one assembly of two constraining members arranged in parallel, with one of the constraining members being situated within the hollow interior of the spar member adjacent to the leading edge portion and with the other constraining member being situated within the hollow interior of the spar member adjacent to the spar heel portion, such that in each assembly the constraining members have that portion of their outer surfaces which face the adjacent inner surface of the spar member substantially conforming to the chordwise shape of the adjacent inner surface of the spar member;

(d) an associated load absorbing elastic member for each assembly of constraining members, each load absorbing elastic member having a stiffness less than that of the spar member and the constraining members of its associated assembly, each being spanwise coextensive with the constraining members of its associated assembly, and each being situated within the hollow interior of the spar member between the inner surface of the spar member and constraining members of its associated assembly, as a result of which the shape of each load absorbing elastic member also substantially conforms to the shape of the adjacent inner surface of the spar member and that portion of the outer surface of its associated constraining member that faces the adjacent inner surface of the spar member, wherein each load absorbing elastic member is attached to the outer surface of its associated constraining member and to the adjacent inner surface of the spar member;

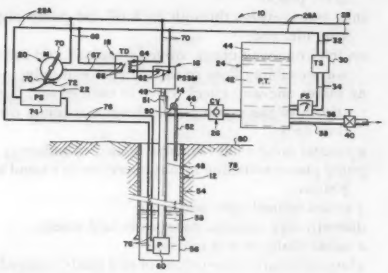
(e) at least one further constraining member situated within the trailing edge wedge, having substantially parallel surfaces facing the trailing edge wedge; and

(f) two further load absorbing elastic members associated with each further constraining member, each load absorbing elastic member having a stiffness less than that of their associated constraining member and the trailing edge wedge, the further load absorbing elastic members being attached to their associated further constraining members along a respective one of its parallel surfaces and to the facing trailing edge wedge.

4,329,120
PUMP PROTECTOR APPARATUS

William Walters, 910 W. Caddo, Cleveland, Okla. 74020

Filed Apr. 24, 1980, Ser. No. 143,355
Int. Cl.[3] F04B *49/00*
U.S. Cl. 417—12 5 Claims



1. In a pumping system in which a pump is powered to pressurize a liquid from a sump, to flow to a tank through a first pipe and a check valve;

apparatus for controlling the power to said pump whenever power is applied to said pump but pressurized liquid fails to arrive at said tank, comprising;

(a) an orifice in said first pipe going from said pump to said check valve and said tank, said orifice positioned upstream of, and near said check valve, to bleed off liquid from said first pipe;

(b) pressure sensitive switch means (PSSM) connected to said first pipe near said orifice, said PSSM adapted to control the power to said pump when there is no pressure, and no flow of liquid, from said pump to said check valve;

(c) power switch means for applying power to said pump means, said power switch means comprises;

(1) motor and cam means responsive to said PSSM to run when said PSSM is closed;

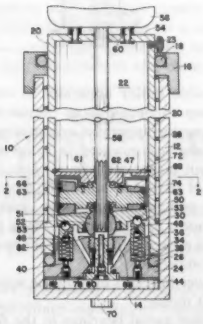
(2) power switch for applying power to said pump means, said power switch responsive to said motor and cam means; and

(d) time delay means between said PSSM and said power switch means.

4,329,121
FORCE DELIVERING HAND TOOL

Jack T. Gregory, P.O. Box 556, San Anselmo, Calif. 94960

Filed Mar. 7, 1980, Ser. No. 128,239
Int. Cl.[3] F04B *1/18*
U.S. Cl. 417—270 5 Claims



1. A portable lineal force delivering implement comprising:

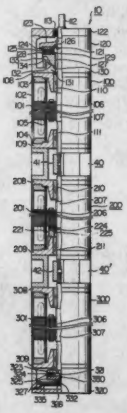
a cylinder;
a drive piston slidably carried in said cylinder;
a self-contained fluid reservoir in said reservoir on one side of said drive piston and exposed thereto;
a plurality of oil passage bores through said drive piston;
a pump piston slidable in each of said bores with an inlet end thereof protruding from said bore on said one side of the drive piston;
inlet passageways through each of said pump pistons from said inlet end;
an inlet one-way check valve in each of said inlet passageways enabling flow from said inlet end only;
an outlet one-way check valve in each of said bores downstream of the pump piston therein, enabling downstream flow only;
a coaxial drive shaft rotatable in said cylinder;
pump piston-actuating means operative to extend said pump pistons;
a wheel splined onto said shaft;
diametrically opposed recesses in said wheel;
a radial shafts in said recesses;
a large pressure roller on one of said shafts engaged with said actuating means and a smaller guide roller on the other of said shafts;
an annular cowl on said wheel with a depending peripheral skirt to enclose said wheel, recesses and rollers.

4,329,122

SUBMERSIBLE MOTOR APPARATUS

Takeyoshi Owada, Funabashi, and Yasuro Suzuki, Narashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1979, Ser. No. 35,238
Claims priority, application Japan, May 8, 1978, 53/53759
Int. Cl.³ F04D *13/08*
U.S. Cl. 417—365 **6 Claims**



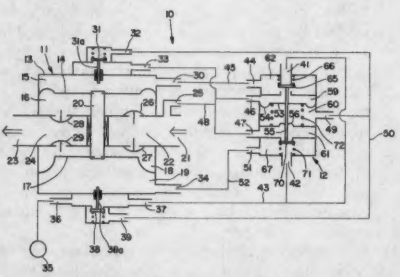
1. A submersible motor apparatus in combination with a submersible pump connected to an output shaft of said motor apparatus, said motor apparatus comprising at least two unit motors having shafts connected in series in the direction of gravity, each unit motor including a stator core and a rotor core, the shaft of the uppermost unit motor constituting the output shaft of said motor apparatus, said pump being connected to said motor apparatus such that a suction side of said pump is disposed adjacent to said motor apparatus, wherein the improvement comprises:
upper and lower brackets closing the upper and lower ends of each unit motor;
upper and lower radial bearings in the form of cylindrical sleeves mounted on and disposed centrally of said upper and lower brackets of each unit motor;
the shaft of each unit motor extending through said sleeves for axial movement relative to said sleeves;
an upper thrust bearing disposed above the upper sleeve of said uppermost unit motor and being adapted to bear the weight of the stator and shaft of said uppermost unit motor and a thrust produced in said pump during pumping operation and exerted to said motor output shaft in the direction of gravity;
a lower thrust bearing disposed below the lower sleeve of the lowermost unit motor and being adapted to bear an axial load applied to the shaft of said lowermost unit motor; and
a coupling means disposed between said uppermost unit motor and the unit motor immediately following said uppermost unit motor to connect the lower and upper ends of the shaft of said uppermost and following unit motors relative axial movement with respect to each other.

4,329,123

DIAPHRAGM AIR PUMP ASSEMBLY

Yasuhiro Kawabata, Anjo, and Noriyoshi Shibata, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 17, 1980, Ser. No. 113,079
Claims priority, application Japan, Jan. 17, 1979, 54-4100
Int. Cl.³ F04B *43/06;* **F01L** *23/00*
U.S. Cl. 417—393 **7 Claims**



1. A diaphragm air pump assembly adapted for use in pneumatic association with a vacuum source and an atmospheric air source, comprising in combination: a pump device including a pump body, first and second pump diaphragms mounted in said body and dividing the interior of said body into first and second pump chambers and first and second vacuum operational chambers, a vertically extending rod interconnecting said first and second diaphragms and movable in unison therewith; a control device for said pump device including a control body, a first valve member in said control body for controlling admission of vacuum to said first vacuum operational chamber, a second valve member in said control body for controlling admission of vacum to said second vacuum operational chamber, reciprocable means interposed between said first and second valves and movable to alternatively actuate said first and second valves thereby admitting the vacuum alternatively to said first and second vacuum operational chambers, first and second control diaphragms fixed at their outer portions to said control body and at their inner portions to said reciprocable means and defining a movable pressure chamber in said body which is movable with said reciprocable means, a first normally closed valve interposed between said vacuum source and said variable pressure chamber and actuated to open when said first and second pump diaphragms in unison with said rod are moved in one direction, and a second normally closed valve interposed between said atmospheric air source and said variable pressure chamber and actuated to open when said first and

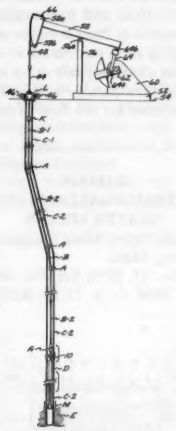
second pump diaphragms in unison with said rod are moved in the other direction, whereby the alternative admission of vacuum to said first and second vacuum operational chambers effect the pumping operation by alternative admission of air to said first and second pump chambers.

4,329,124

CONNECTOR ASSEMBLY

Whetstine B. Pridy, 3610 Long Beach Blvd., Long Beach, Calif. 90807

Filed Aug. 25, 1980, Ser. No. 180,843
Int. Cl.³ F04B *47/02*; F16D *1/12*
U.S. Cl. 417—545 **4 Claims**



1. A connector assembly for use is so connecting adjacently disposed, longitudinally spaced, externally threaded end portions of first and second strings of sucker rod that the latter may be moved downwardly through an oil well tubing string that has first and second angularly disposed sections and thereafter be reciprocated therein, said connector assembly substantially eliminating torsional twist from one of said strings of sucker rod being transferred to the other thereof as said first and second strings of sucker rod are longitudinally stressed during concurrent reciprocation thereof, said connector assembly including:

a. an elongate shank and a ball of greater diameter than that of said shank and from which ball said shank extends outwardly, said shank having a flat free end that has a slot of non-circular transverse cross section extending inwardly therefrom, and threads on the exterior of said shank adjacent said free end;

b. a first rigid upwardly disposed box that has an upper and a lower end, a first threaded bore that extends downwardly from said upper end, a threaded counterbore that extends upwardly from said lower end, said first threaded bore engaged by a threaded end portion of said first string of sucker rod, and said threaded counterbore by said threads on said shank;

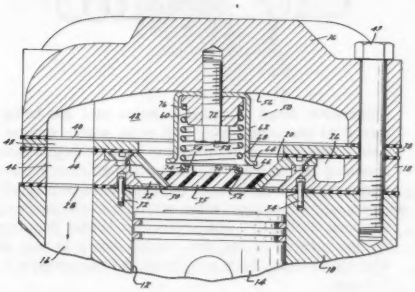
c. a second rigid box that has upper and lower ends, a tapped recess that extends upwardly from said lower end and is engaged by a threaded end portion of said second sucker rod string, a centered bore that extends downwardly from said upper end of said second box to a cavity in which said ball is snuggly disposed, said shank extending outwardly through said bore, said bore of substantially greater diameter than that of said shank and cooperating therewith to define an annulus space, said shank when said slot is engaged by an elongate tool such as a screwdriver prior to said first sucker rod string being connected to said first box moving said second box longitudinally relative to said first box to have a desired longitudinal spacing between said first and second boxes, and said connector assembly when said first sucker rod string is connected to said first box permitting said first and second sucker rod strings to be reciprocated and longitudinally stressed when angularly disposed relative to one another, with said connector assembly preventing torsional twisting that develops in one of said sucker rod strings being transmitted to the other thereof.

4,329,125

DISCHARGE VALVE

Dale T. Chambers, Dayton, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Filed Jan. 22, 1980, Ser. No. 114,345
Int. Cl.³ F16K *15/02*
U.S. Cl. 417—569 **19 Claims**



17. In a compressor having a pumping chamber, means defining a discharge chamber, a discharge passageway extending between said chambers, and a disc-like pressure responsive discharge valve in said passageway and movable along a center axis for controlling fluid flow from said pumping chamber to said discharge chamber, and a plate separating an inlet passageway from said discharge chamber, an improved discharge valve assembly comprising:

a first annular seat on said valve, said first seat being disposed in said discharge chamber when said valve is closed;

support means having integrally formed thereon a second annular seat disposed in facing parallel and coaxial relationship with said first seat,

a cylindrical spring guide, and

an annular stop surface on said guide lying in a plane transverse to said axis, said stop surface being spaced a uniform predetermined distance from said valve for limiting the opening movement thereof;

a spring supported by and compressed between said seats and biasing said valve in a closing direction, said spring guide surrounding said spring in closely spaced relationship thereto, said guide extending for a substantial portion of the axial distance between said seats; and fastener means affixing said support means to said plate.

4,329,126

METHOD FOR PREVENTING A LEAKAGE LOSS OF GASES IN A SCREW COMPRESSOR

Yoshiyuki Nishimura, Kakogawa, Japan, assignor to Kobe Steel Limited, Kobe, Japan

Filed Nov. 13, 1978, Ser. No. 960,084
Claims priority, application Japan, Nov. 11, 1977, 52-136101
Int. Cl.³ F04C *18/16, 27/00, 29/00*
U.S. Cl. 418—1 **3 Claims**

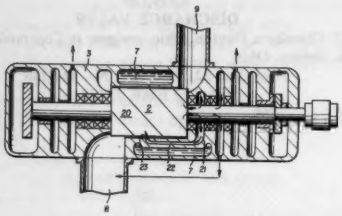
1. A method for preventing a leakage loss of gases in an oil-free screw type rotary compressor including a housing, a rotory assembly comprising a pair of male and female rotor members rotatably mounted within said housing and a cooling

jacket surrounding, said housing and said pair of male and female rotor members defining therebetween an axially progressive series of sealed cavities for a gas, which method comprises the steps of:

collecting gaseous working fluid leaking from rotor shaft seals on the discharge side of the compressor;

cooling the leakage gas from the rotor shaft seals on the discharge side of the compressor;

returning, as cooled, the leakage gas to a first of said axially



progressive series of sealed cavities, said gas being returned to the compressor at a point where suction has been completed and compression is yet to begin, thereby obtaining an increase in volumetric efficiency directly proportional to the leakage of the gaseous working fluid;

wherein said leakage gas being returned to the compressor has been cooled to a temperature no higher than that of the gas already in said first sealed cavity at said point where suction has been completed and compression is yet to begin.

4,329,127

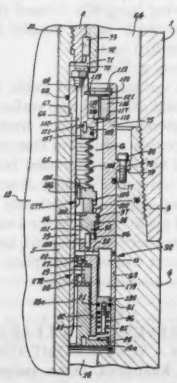
SEALED BEARING MEANS FOR IN HOLE MOTORS

John E. Tschirky, Long Beach, and Bela A. Geczy, Glendale, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Continuation of Ser. No. 818,423, Jul. 25, 1977, abandoned. This application Mar. 6, 1980, Ser. No. 127,657

Int. Cl.[3] **F03C** *2/22;* **E21B** *4/02;* **F16J** *15/40;* **F16C** *33/76*

U.S. Cl. 418—48 **29 Claims**



1. In a sealed and lubricated bearing assembly for use with a fluid motor having a stator housing, and a motor fluid driven rotor said rotor rotated by motor fluid passing through said stator: an elongated tubular housing structure; a drive shaft having a flow passage therethrough and rotatable in said housing structure and having means at one end connectible with the motor rotor, the other end of said drive shaft projecting from said housing structure; a pair of axially spaced sealing structures between said housing structure and said drive shaft adjacent the ends thereof and defining therewith a bearing chamber adapted to contain a liquid lubricant; means responsive to fluid pressure externally of said housing structure for pressurizing said liquid lubricant between said sealing structures; axial and radial bearing means in said chamber engaged between said housing structure and said drive shaft for transmitting axial and radial loads between said housing structure and said drive shaft; one of said sealing structures being adjacent said one end of said drive shaft and reservoir means adapted to contain a clean fluid and said last named sealing structure including seal means separating said chamber from said reservoir and exposed only to fluid in said chamber and said reservoir and means including pressure transfer means for isolating clean fluid in said reservoir from and pressurizing said clean fluid responsive to the pressure of fluid in either said chamber or the motor fluid discharging from said stator in said housing structure externally of said chamber; said drive shaft having a port opening between said flow passage and said housing structure externally of said chamber for the flow of motor fluid through said drive shaft.

4,329,128

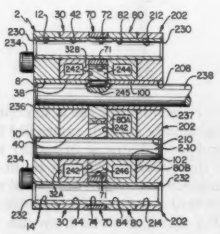
PUMP FOR THERMOPLASTIC MATERIALS WITH HEATER MEANS

Louis V. Forgues, Lunenburg, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed Dec. 17, 1979, Ser. No. 104,315

Int. Cl.[3] **F04C** *2/18, 15/00;* **B25F** *3/08*

U.S. Cl. 418—83 **17 Claims**



1. A gear-type pump for bulk thermoplastic material in fluid form, said pump comprising:

a front plate having first and second opposite side surfaces and inlet and outlet conduits for passage of thermoplastic material therethrough, said inlet and outlet conduits each extending between and terminating at said first and second opposite side surfaces;

a first heater plate disposed adjacent and parallel to said front plate, said first heater plate having opposite side surfaces and inlet and outlet conduits extending between its said side surfaces in aligned and communicating relation with said front plate inlet and outlet conduits respectively;

a center plate with a hole therein disposed adjacent and parallel to said first heater plate;

a second heater plate disposed adjacent and parallel to said center plate;

said first and second heater plates and said center plate hole defining a chamber having an inlet and an outlet formed by the inlet and outlet conduits respectively of said first heater plate;

intermeshing gears disposed in said chamber and adapted to receive said thermoplastic material introduced at said chamber inlet and drive said material out of said chamber via said chamber outlet, said gears being disposed for rotation on axes extending at a right angle to the plane of said center plate;

a back plate disposed adjacent and parallel to said second heater plate; and

means urging said front and back plates toward each other so as to clamp said heater plates and said center plate therebetween in fluid sealing relation to one another;

said heater plates being provided with means for providing heat to said plates, said gears and said thermoplastic material in said chamber and said inlet and outlet conduits.

4,329,129
VANED ROTOR FOR ROTARY MECHANISMS WITH BEARINGS IN VANE SLOTS

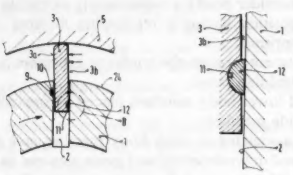
Yutaka Ishizuka, Higashimatsuyama, and Shinichi Kobayashi, Kawagoe, both of Japan, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1979, Ser. No. 94,664

Claims priority, application Japan, Nov. 22, 1978, 53/161155[U]

Int. Cl.³ F01C *21/02*

U.S. Cl. 418—138 **6 Claims**



1. An improved mechanism for use in pumps, compressors and the like, comprising

a rotor having an axis, a circumferential surface circulating around the axis and at least one slot extending inwardly from the surface, each such slot having a leading surface and a trailing surface which surfaces are flat and parallel to each other, the slot having an elongated trailing groove in each trailing surface extending parallel to the axis and having a cross-sectional shape taking on the shape of a segment of a circle having a chord which is smaller than a diameter of the circle;

a number of vanes equal to the number of slots, each vane being located within a corresponding slot in the rotor, with each vane being elongated parallel to the axis and having the shape of a rectangular parallelopiped with a leading face, a trailing face and rounded upper edges;

a number of trailing bearings equal to the number of slots and having the shape of an elongated bar with a cross-sectional shape taking on the shape of a semicircle of the circle, each trailing bearing resting within a corresponding trailing groove and being located between the rotor and the corresponding vane; and

the leading face of each vane bearing an elongated leading groove extending parallel to the axis, the groove having the cross-sectional shape of a segment of a second circle with a chord which is smaller than the diameter of the second circle and further including a number of leading bearings equal to the number of slots, each leading bearing having the shape of an elongated bar with a cross-sectional shape taking on the shape of a semicircle of the second circle, each leading bearing resting within a corresponding vane and the rotor.

4,329,130
FLOW METER WITH HELICAL TOOTHED ROTORS HAVING NO PULSATION AND ZERO CONTACT PRESSURE

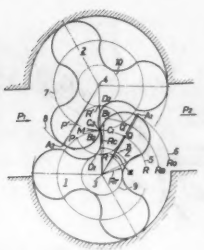
Shigeyoshi Nagata, and Koji Hotta, both of Tokyo, Japan, assignors to Oval Engineering Company Limited, Tokyo, Japan

Filed Jul. 2, 1979, Ser. No. 53,716

Claims priority, application Japan, Jul. 3, 1978, 53-79753; Jul. 3, 1978, 53-79754

Int. Cl.³ F01C *1/16*; G01F *3/10*

U.S. Cl. 418—150 **3 Claims**



1. A positive displacement flow meter with helical toothed rotors, in which respective tooth profile curves are continuously contacted with each other in order not to cause any blockade of fluid between the respective tooth profile curves, each of the rotors has the same profile and the same size, and the twist ratio $i=L(\tan/M\pi)B$; wherein i is a positive integral number, M=module, L=axial length of the helical toothed rotor, B=twist angle, whereby a pair of helical toothed rotors are rotatable to each other with no pulsation and a tooth-to-tooth surface contact pressure being maintained at zero, and wherein the twist ratio is 1 and the number of teeth in each rotor is 3, whereby the discharge of the flow meter approaches the maximum theoretical discharge.

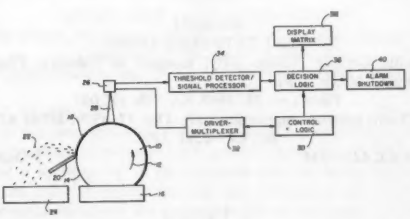
4,329,131
TNT STATE SENSOR

Asa E. Roane, Pulaski, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 28, 1980, Ser. No. 144,746

Int. Cl.³ B22D *11/01*

U.S. Cl. 425—6 **10 Claims**



1. A TNT State Sensor for a rotating drum having a reflective surface rotating through liquid TNT to develop a TNT film on said drum,

said sensor comprising:

a light emitter beaming light toward the surface of said drum,

said light having a frequency such that it propogates substantially undiminished through liquid TNT on said drum and substantially does not propogate through or reflect from TNT in a solid film state on said drum, and

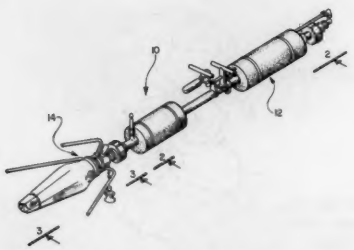
a detector sensing light reflected from said drum through said liquid TNT.

4,329,132

HOLE PLUGGING SYSTEM

Robert W. Melvold, Simi Valley; John J. Vrolyk, Northridge, and George H. Smith, Fillmore, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 6, 1980, Ser. No. 194,206
Int. Cl.³ B63B *43/16*; B32B *35/00*
U.S. Cl. 425—13 **14 Claims**



1. A hole-plugging system comprising in combination a foam storage and delivery assembly and a hole-plugging assembly:

the storage and delivery assembly comprising:

a source of a pressurized fluid,

an elongated storage housing having an inlet end and a discharge end, each end being sealed with a diaphragm,

means for delivering pressurized fluid from said source to said inlet end of said housing to rupture the diaphragms,

a body of foamable material contained in said housing and means for connecting said storage and delivery assembly in fluid communication with the hole-plugging assembly;

the hole-plugging assembly comprising:

a body member having a passageway therethrough for receiving foamable material from said discharge end of said storage housing and

a flexible, nonelastic bag member having a closed end and an open end, said open end being affixed to said body member for receiving foamable material therefrom, said closed end being substantially larger than said open end; and

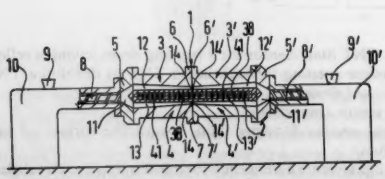
locating means for locating said hole-plugging assembly at a proper depth in a hole to be plugged and retaining the assembly in position when foamable material is introduced into the bag member.

4,329,133

FLAT EXTRUDER HEAD

Achille Gallizia, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Oct. 15, 1980, Ser. No. 197,061
Claims priority, application Italy, Oct. 17, 1979, 26543 A/79
Int. Cl.³ B29F *3/04*
U.S. Cl. 425—114 **7 Claims**



1. An extrusion apparatus comprising an extrusion head for shaping an extrudable elastomeric composition to form an elongated band having a substantially rectangular cross-section and opposite substantially flat surfaces and at least one reinforcing member substantially completely embedded and disposed longitudinally in said band, said extrusion head comprising a shaping die having top and bottom walls and opposite side walls enclosing an opening through the die of substantially rectangular cross-section, a guide member disposed through said opening for locating said reinforcing members in the elastomeric composition as the composition is shaped to form said band, said guide member comprising a housing with top and bottom walls enclosing an open space through which the reinforcing members slide, said top and bottom walls of the guide member being disposed substantially parallel to said top and bottom walls of the die, said guide member being spaced inwardly from said top, bottom and lateral walls of the die for flow of elastomeric composition thereabout, said side walls of the die supporting said top and bottom walls of the die and said guide member in spaced relation, means operably associated with each of opposite sides of the extruder head for charging under pressure a stream of elastomeric composition into the space between the top and bottom walls of the die and against the side edges of the guide member which directs flow of elastomeric composition to opposite sides of the guide member, and means for restricting said stream prior to entrance in the die opening for flow above and below the said guide means and to enclose said reinforcing members in the resulting shaped elastomeric composition emerging from the die.

3. A flat extruder head for continuously extruding an elastomeric composition having a reinforcing member embedded therein comprising:

a guide element wherein the reinforcing member is guided to the embedding zone,

upper and lower body members placed on opposite sides of said guide member,

a gauge, associated to each body member and projecting above and downstream of said guide element, in the direction of extrusion, to define in conjunction therewith said embedding zone,

first means for maintaining said body members in contact with said guide element on opposite sides thereof and extending the entire width of said extruder head,

a conduit in each body member, provided with at least one inlet for the elastomeric composition, said conduit being substantially perpendicular to the direction of extrusion,

each body member having a continuous slot traversing the body member for conveying the elastomeric composition from each conduit to the embedding zone,

second means traversing said slot for preventing the opening thereof when the elastomeric composition flows therethrough, and

third means for restricting the flow of elastomeric composition through said slots.

4,329,134

IN-THE-MOLD COATING APPARATUS AND METHOD

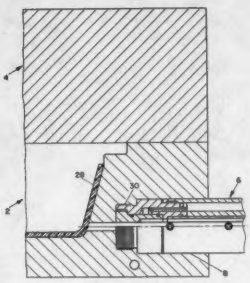
Sigurdur I. Arnason, and Edward J. Kleese, both of Ionia, Mich., assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 974,583, Dec. 29, 1978, Pat. No. 4,235,833, which is a continuation-in-part of Ser. No. 944,093, Sep. 20, 1978, which is a continuation-in-part of Ser. No. 897,980, Apr. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 814,502, Jul. 11, 1977, abandoned. This application Sep. 19, 1980, Ser. No. 188,781
Claims priority, application Canada, Apr. 24, 1978, 301797
Int. Cl.³ B29F *1/03*
U.S. Cl. 425—157 **1 Claim**

1. In an apparatus for forming a glass fiber reinforced thermoset resin part having

(a) a mold having a lower die (2) and an upper die (4) and a ram for opening and closing the mold;

(b) a means for parting one of the mold dies from the part while maintaining the mold sealed, in a timed sequence after the part is cured;
(c) a timer to control the timed sequence;
(d) an injector (6) having a water cooled injection nozzle permanently attached to one of the two dies for the purpose of injecting a coating resin upon the glass fiber reinforced resin part formed between the two dies only during the parting;
(e) the means to control the timed sequence consisting of the timer of the mold used to control the molding cycle;



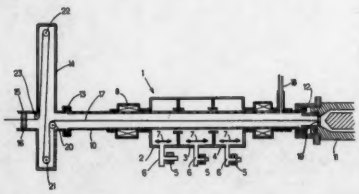
wherein the improvement comprises
(f) the injector being positioned in the die so that a stream which flows from the injector flows parallel from the injector onto the surface of the part;
(g) the parting means consisting of the ram which forces the mold closed;
(h) the means to control the timed sequence of the mold parting step consisting of the timer of the mold used to control the degass cycle; and
(i) wherein a roughened surface on the die is the surface of the die which forms the more visible surface of the part.

4,329,135

DEVICE FOR THE CONTINUOUS THERMAL OR THERMO-CHEMICAL TREATMENT OF OBJECTS BY EMISSION OF MICRO-WAVES

Michel Beck, Enghien-les-Baines, France, assignor to Technics Lambda International, Enghien-les-Baines, France

Filed Mar. 19, 1980, Ser. No. 131,848
Int. Cl.³ B29H *5/24*
U.S. Cl. 425—174 **8 Claims**



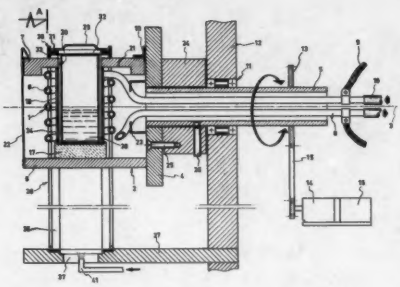
1. A device for the continuous thermal treatment of objects by emission of micro-waves, comprising an applicator inside which the micro-waves are generated, characterized in that it comprises inside said applicator a tubular coaxial enclosure made from a material inert to the micro-waves, through which pass the objects to be treated, and connected to means for generating a relative vacuum or treatment gas atmosphere, this enclosure being sealed and comprising means allowing objects to be treated to enter and leave while ensuring the continuity of the seal.

4,329,136

APPARATUS FOR THE AUTOMATIC PREPARATION OF AN X-RAY SPECTROMETRY SAMPLE

Gerard Willay, Ars sur Moselle, and Andre Wittmann, Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), St-Germain-en-Laye, France

Continuation of Ser. No. 878,762, Feb. 17, 1978, abandoned.
This application Jan. 11, 1979, Ser. No. 2,782
Claims priority, application France, Feb. 21, 1977, 77 05002
Int. Cl.³ B28B *17/00*
U.S. Cl. 425—174.8 R **10 Claims**



1. An apparatus for the automatic preparation of a sample of a material to be analyzed, which comprises
(a) a crucible for holding fusible material from which the sample is to be taken by casting the material fused therein,
(b) an induction coil means for heating the crucible until the material therein is fused, and
(c) means for agitating the crucible during fusion of the material and for turning the crucible from an upright position wherein the material is fused to a casting position wherein the fused material is cast from the crucible, said means including
(1) a mobile support mounted for rotation about a horizontal axis extending perpendicularly to the axis of the induction coil means,
(2) means for affixing the induction coil means to the support for rotation therewith, and
(3) means for imparting rotation to the support.

4,329,137

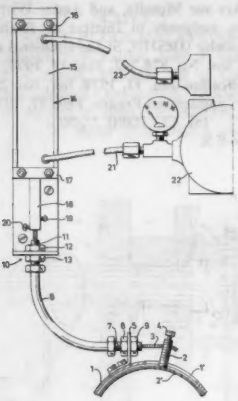
DEVICE FOR CHOKE ADJUSTMENT

Stig Werne, 13, Hermelinsvägen, S-433 00 Partille, Sweden

Filed May 1, 1980, Ser. No. 145,420
Claims priority, application Sweden, May 2, 1979, 7903808
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—75 **3 Claims**

1. An arrangement for choke adjustment depending upon the working conditions in oil burning plant, characterised in that it is composed of an operating unit (14) consisting in a piston cylinder (15) the pressure side of which is connected to the pressure side of the fuel pump (22) of the plant, in such a manner that the piston (24) performs a working stroke when the pump starts and returns to the starting position when the pump stops, the piston rod (18) of the piston cylinder unit being coupled to a throttle which opens as a result of said working stroke and closes on the return stroke, the piston cylinder unit being provided with a mobile end position abutment consisting in a secondary piston (29) which is slidably mounted in a secondary cylinder housing (30) which communicates with a sensing device (33) which encloses an expansion liquid the volume of which being determined by the temperature of the flue gases from the oil burning plant and the degree of expan-

sion of said liquid determines the displacement position of the secondary piston and thus the end position abutment, and also



the reduction of the degree of opening of the throttle on increased flue gas temperature, and vice-versa.

4,329,138

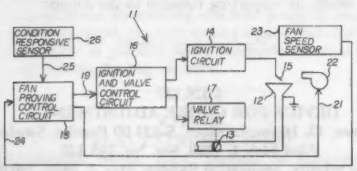
PROVING SYSTEM FOR FUEL BURNER BLOWER

William J. Riordan, Shrewsbury, Mass., assignor to Walter Kidde and Company, Inc., Clifton, N.J.

Filed Jun. 12, 1980, Ser. No. 158,899

Int. Cl.³ F23H *1/02*

U.S. Cl. 431—90 **22 Claims**



1. A fuel burner ignition system comprising:

electrical igniter means for igniting fuel emanating from a burner;

a valve controlling the flow of fuel to the burner;

condition responsive means;

electrical start-up control circuit for opening said valve and energizing said igniter means in response to a call-for-heat signal from said condition responsive means;

a fan means for forcing air by the burner;

a sensor circuit for monitoring rotation of said fan and producing a speed signal indicative of the rotational speed thereof; and

inhibit circuit means that produces a fault signal that prevents energization of said igniter means and opening of said valve in response to a value of said speed signal indicating any rotational speed of said fan means outside of a given range of speeds.

4,329,139

COMBUSTION APPARATUS

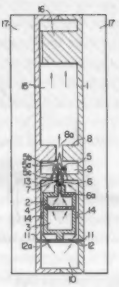
Tadashi Shinozaki, Tsuchiura; Takashi Hashimoto, Ibaraki, and Shigeyuki Yamazaki, Abiko, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1979, Ser. No. 70,504

Claims priority, application Japan, Aug. 28, 1978, 53-116679[U]; Oct. 27, 1978, 53-131656; Apr. 12, 1979, 54-43074

Int. Cl.³ F23D *13/24;* F24H *3/06*

U.S. Cl. 431—350 **14 Claims**



1. A combustion apparatus, which comprises a burner frame, a line-form burner having a mixing chamber for mixing a fuel with primary air and a flame nozzle having a flame nozzle face, a throttled part provided within the burner frame, and a combustion chamber formed by the throttled part and the burner frame, the flame nozzle face of the burner being provided in the combustion chamber facing toward an opening of the throttled part, the mixing chamber communicating a mixed gas with the flame nozzle for injecting it into the combustion chamber from the flame nozzle at the flame nozzle face, and supply means for directing a flow of secondary air into the combustion chamber from both sides of the flame nozzle face, wherein a width a of the flame nozzle at the flame nozzle face, a width b of the opening of the throttled part, a thickness t of the throttled part, and a distance h from the flame nozzle face to the throttled part satisfy the following relations:

$$a \leqq b \leqq a+3 \text{ mm}$$

$$3 \text{ mm} \leqq t \leqq 15 \text{ mm for a fuel of good diffusion,}$$

or

$$5 \text{ mm} \leqq t \leqq 20 \text{ mm for a fuel of poor diffusion,}$$

$$5 \text{ mm} \leqq h \leqq 10 \text{ mm for a fuel of poor diffusion,}$$

or

$$10 \text{ mm} \leqq h \leqq 20 \text{ mm for other fuel,}$$

wherein said flame nozzle had a passage for supplying the mixed gas to the flame nozzle face from the mixing chamber, and a partition plate means for dividing the mixed gas in a manner promoting mixing thereof with said secondary air flow is provided in the passage of the flame nozzle spaced a little below the flame nozzle face in a manner subdividing said flame nozzle into a large number of main flame nozzles for producing a large number of jet-like flames.

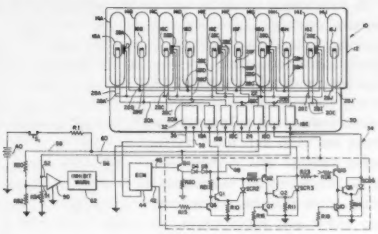
4,329,140
MULTIPLE FLASH ARRANGEMENT WITH REDUNDANT FUSE ARRANGEMENT

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 58,855, Jul. 19, 1979. This application Nov. 14, 1980, Ser. No. 206,745

Int. Cl.³ G03B *15/02*

U.S. Cl. 431—359 **4 Claims**



1. A multi-lamp photoflash array for use with a camera of the type having means for providing a flash fire signal at one of a plurality of flash fire terminals wherein the flash fire signal is normally sequentially advanced from one terminal to another in correspondence with each exposure cycle, said flash array comprising:

a plurality of flash lamps;

connector means for receiving the flash fire signal from the camera flash fire signal means and for directing the flash fire signal from each flash fire terminal to a select pair of said plurality of flash lamps, said connector means comprising a plurality of spaced apart terminal elements arranged for complementary connection with respect to the camera flash fire terminals and a plurality of conductive leads for interconnecting respectively each of said photoflash terminal elements with a pair of flash lamps;

common means for providing a common connection from said photoflash array back to the camera, said common lead means comprising a common lead conductor and an other terminal with said common lead conductor connecting directly to a first one of said lamps in each of said pairs of flash lamps and to said other terminals; and

switch means responsive to the firing of said first one of said flash lamps in each of said flash lamp pairs for connecting to said common lead means the second one of said flash lamps in said same flash lamp pair and the second one of said flash lamps in the immediately preceding flash lamp pair in said flash fire sequence so as to enable the subsequent firing of said second one of said flash lamps in said preceding pair of flash lamps during the next exposure cycle in the event that said first one of said flash lamps or its associated switch means in said preceding flash lamp pair did not operate during the preceding exposure cycle.

4,329,141
METHOD OF AND DEVICE FOR HEATING FINELY DIVIDED SOLID PARTICLES IN CONVEYING DUCTS

Diethard Habermehl, and Werner Kucharzyk, both of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Fed. Rep. of Germany

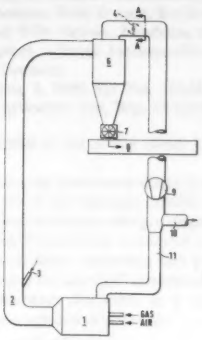
Filed Oct. 27, 1980, Ser. No. 201,325

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944383

Int. Cl.³ F27B *15/18;* **F27D** *7/00;* **F27B** *15/00*

U.S. Cl. 432—17 **6 Claims**

1. A method of heating finely divided solid particles, comprising the steps of feeding a stream of hot gas into an upright duct; dispersing said particles into said stream in a lower zone of said duct; conveying said particles by said stream upwardly to an upper zone of said duct; separating the heat treated particles in the upper zone from the gas stream; and pulsating



the separated gas stream in the upper zone so as to periodically accelerate and decelerate the gas stream with entrained solid particles in said duct whereby the heat transfer rate is increased.

4,329,142
METHOD FOR HEAT TREATMENT OF CLAY AND REFRACTORY WARE

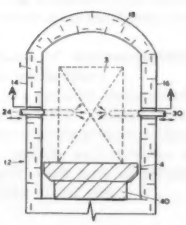
Anthony O. Dyer, Wetherby, England, assignor to BOC Limited, London, England

Filed Jun. 10, 1980, Ser. No. 158,185

Claims priority, application United Kingdom, Jun. 18, 1979, 7921192; Mar. 26, 1980, 8010115

Int. Cl.³ F27D *7/00;* **F27B** *9/04, 9/00*

U.S. Cl. 432—19 **9 Claims**



1. A method of firing items of clay or refractory ware which are arranged in spaced apart stacks and are passed through a tunnel kiln having preheat, burning and cooling zones in the direction of travel of ware through the kiln comprising the steps of:

passing air through the kiln in a direction countercurrent to the direction of travel of said stacks;

operating burners disposed in said kiln burning zone to heat said ware to enable oxidation of carbon in the ware in an oxidation zone within the burning zone;

introducing a flow of gas relatively enriched in oxygen in comparison to air into the oxidation zone at a rate such that an oxygen concentration of at least 12% by volume is maintained in the spaces between said stacks and said gas flow penetrates each stack of ware while in the oxidation zone; and

maintaining the temperature in the oxidation zone between 750°–850° C. such that at least 50% of the carbon in said ware is oxidized in the oxidation zone.

4,329,143

SIMULATED BERBER YARN AND PROCESS OF PRODUCING SAME

William F. Hutcheson, Lookout Mountain, Tenn., assignor to Rossville Yarn Processing Company, Rossville, Ga.

Division of Ser. No. 41,183, May 21, 1979. This application Apr. 10, 1980, Ser. No. 138,828

Int. Cl.[3] D06P *5/00*

U.S. Cl. 8—483 6 Claims

1. A process for producing a synthetic yarn having an appearance simulating the natural aesthetic appearance of "Berber" wool yarns, said process utilizing a synthetic continuous filament or long staple spun synthetic yarn, and comprising the steps of applying to the yarn at various locations along the length thereof and at various angular locations around the peripheral surface of the yarn at least one heather color dye while limiting the penetration thereof to the surface areas only of the yarn so that the heather color dye does not penetrate through the yarn but forms random size heather colors of varying lengths on various portions of the peripheral surface of the yarn, and applying to the yarn at selected areas along the length thereof at least one accent color dye while causing penetration thereof through the yarn to form short areas of the accent color at random locations along the yarn.

4,329,144

DISPERSE DYE STABLE TO DYEING, AND ITS USE FOR DYEING AND PRINTING SYNTHETIC AND SEMI-SYNTHETIC FIBRE MATERIALS

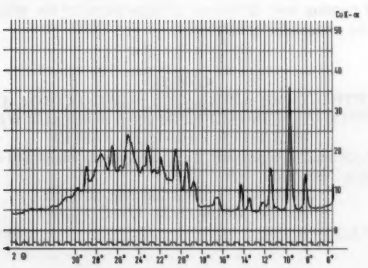
Peter Eugster, Arlesheim, and Stefan Koller, Ramlinsburg, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,459

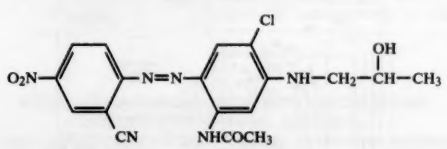
Claims priority, application Switzerland, Dec. 27, 1979, 11460/79; Jan. 9, 1980, 134/80

Int. Cl.[3] D06P *67/02*

U.S. Cl. 8—526 6 Claims



1. A modification of the dye of the formula



which modification is stable to dyeing and which is characterised by the X-ray diffraction pattern (CuK-α radiation) with the characteristic reflexes shown in FIG. 1, and by the d values of the interplanar spacings, calculated from the diffraction pattern:

d [A]: 10.9 s, 9.1 ss, 7.7 s, 6.2 s, 4.58 s, 4.34 s, 3.86 s, 3.57 s, 3.37 s, 3.09 s.

4,329,145

PROCESS FOR PRODUCING LIQUID DYESTUFF PREPARATIONS

Jochen Koll, Odenthal; Hans-Heinz Mölls, Leverkusen; Reinhold Hörnle, Cologne; Erhard Schuffenhauer, Leverkusen; Horst Brandt, Odenthal; Fritz Bremer; Karlheinz Wolf, both of Leverkusen, and Willy Schiwy, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1980, Ser. No. 176,388

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1979, 2934949

Int. Cl.[3] C09B *67/54, 67/04;* B01D *31/00*

U.S. Cl. 8—527 9 Claims

1. Process for producing concentrated liquid dyestuff preparations of dyestuffs which are sparingly soluble or insoluble in water, comprising in a first step adding a dispersing agent to the water-moist dyestuff press-cake to convert it into a form in which it is capable of flow, subjecting this product to wet grinding and increasing the dyestuff content of the resulting, insufficiently concentrated dispersion in a second step by means of a membrane separation process.

4,329,146

PROCESS FOR THE DYEING OF FIBRE MATERIAL

Jacques Zurbuchen, Pratteln, and Willi Leutenegger, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 14,456, Feb. 23, 1979, abandoned, which is a continuation of Ser. No. 745,492, Nov. 26, 1976, abandoned, which is a continuation of Ser. No. 586,691, Jun. 13, 1975, abandoned, which is a continuation of Ser. No. 302,696, Nov. 1, 1972, abandoned. This application Sep. 29, 1980, Ser. No. 191,550

Claims priority, application Switzerland, Nov. 9, 1971, 16260/71

Int. Cl.[3] D06P *1/613, 1/607*

U.S. Cl. 8—580 5 Claims

1. A batch process for the exhaustion dyeing of textile fibers, in a closed container, comprising the steps of first applying to the textile fibers in the container a non-thickened aqueous dye liquor which will not foam at the dyeing temperature, consisting essentially of

(a) A water-soluble of water-dispersible dyestuff having affinity for the textile fibers,

(b) 0.2 to 10 g/l of a nonionic, surface-active agent, having a cloud point below 85° C., selected from the group consisting of ethylene oxide-fatty amine adducts, ethylene oxide-fatty alcohol adducts and ethylene oxide-alkyl phenol adducts, wherein each mole of adduct contains 4 to 10 moles of ethylene oxide, and

(c) water,

at goods-to-liquor ratio of 1:1.5 to 1:2.5 and at a temperature below the absorption temperature of the dyestuff, subsequently sealing the container and shaking or tumbling the textile fibers and applied aqueous dye liquor sufficiently to evenly distribute the aqueous dye liquor on the textile fibers while still maintaining the temperature below the absorption temperature of the dyestuff, and finally heating the aqueous dye liquor and the textile fibers in the container at a temperature in the range of 95° to 140° C. to exhaust the dyestuff onto the textile fibers.

4,329,147

WETTING SOLUTION FOR USE IN CONTINUOUS DYEING OF POLYAMIDE FABRIC

Paul W. Harris, Richmond, Va., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 12, 1980, Ser. No. 215,966

Int. Cl.[3] D06P *1/62;* B01F *17/00, 17/02, 17/12*

U.S. Cl. 8—636 60 Claims

1. A wetting solution for use in the continuous dyeing of a fabric comprised of synthetic polymer fibers characterized by

a surface energy of about 18 to 20 dynes per centimeter, comprising:

(a) water;

(b) about 1.44 to 15.0 grams per liter of water, of a surfactant having a wetting speed factor of up to 1.75; and

(c) a sufficient amount of a thickening agent to bring the viscosity of the solution to about 10 to 100 centipoises.

4,329,148

DYE MIXTURES, AND THEIR USE IN DYEING POLYESTERS

Guenter Hansen, Ludwigshafen; Wolf-Dieter Kermer, Fussgoenheim, and Jochen-Wilfried Stuck, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

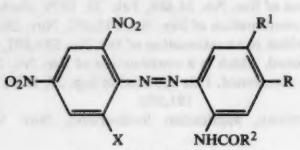
Filed Jan. 6, 1981, Ser. No. 222,926

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004652

Int. Cl.³ C09B *27/00, 45/48;* D06P *1/18*

U.S. Cl. 8—639 **3 Claims**

1. A dye mixture, containing dyes of the formula I



I

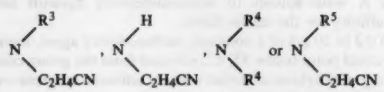
where

X is hydrogen, chlorine or bromine,

R^1 is hydrogen, methoxy, ethoxy or phenoxy,

R^2 is hydrogen, methyl, ethyl, n-propyl or iso-propyl and

R is



where

R^3 is allyl, methallyl, crotonyl, prenyl or benzyl,

R^4 is C_1–C_5-alkyl, allyl, methallyl, crotonyl, prenyl or benzyl and

R^5 is C_1–C_5-alkyl,

the mixture containing not less than 60% of dyes wherein R is

or NHC_2H_4CN, from 0 to 40% of one or more dyes wherein R is

and from 0 to 40% of one or more dyes wherein R is

the two last-mentioned components accounting for not less than 5% of the mixture.

4,329,149

METHOD FOR SPECTROPHOTOMETRIC COMPENSATION FOR COLORIMETRIC REAGENT VARIATION

David J. Schoonover, Loveland, and Paul Larson, Fort Collins, both of Colo., assignors to Hach Chemical Company, Loveland, Colo.

Filed Mar. 6, 1980, Ser. No. 127,724

Int. Cl.³ G01N *21/27, 21/78*

U.S. Cl. 23—230 R **6 Claims**

3. A method for spectrophotometrically compensating for mixing and metering variations in bleaching chemistry analyses in a single beam dual wavelength chemical analyzer, comprising, in successive samples under test,

(a) adding to said sample a reagent system capable of absorbing radiant energy at two wavelengths, the absorbance at a first wavelength being a function of an amount of a parameter in said sample and the absorbance at a second wavelength being a function of said reagent system added to said sample to conduct the tests, said absorbances at said first and second wavelengths being equal at zero parameter concentration;

(b) detecting the radiant energy at said wavelengths with a sensing means that has an output signal indicative of the radiant energy detected;

(c) finding the difference of the logarithm of said sensing means signal at the first wavelength from the logarithm of the sensing means signal at said second wavelength; and

(d) relating said difference of logarithms to the amount of the parameter of interest.

4,329,150

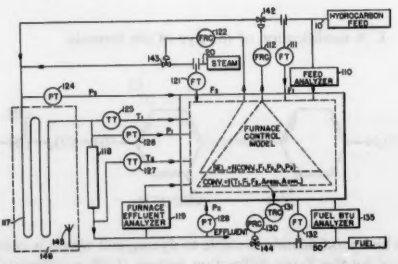
METHOD AND APPARATUS FOR CONTROL AND OPTIMIZATION OF PYROLYSIS FURNACE WITH MULTIPLE PARALLEL PASSES

B. M. Drinkard, Beaumont, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 11, 1980, Ser. No. 215,480

Int. Cl.³ G01N *25/22, 31/12, 33/22*

U.S. Cl. 23—230 A **10 Claims**



1. In a process for the pyrolysis of a feedstock in a pyrolysis furnace with multiple parallel passes which is controlled responsive to analysis of output, the improvement comprising analyzing the output at each of a plurality of said passes and individually controlling conditions in each of said plurality of

passes responsive to the analysis of output of each respective pass.

4,329,151

STABLE DIAGNOSTIC REAGENT AND METHOD FOR QUALITATIVE DETERMINATIONS OF STREPTOCOCCI INFECTIONS

Kingdon Lou, and Tracey L. Burton, both of Fountain Valley, Calif., assignors to ICL Scientific, Fountain Valley, Calif.

Filed Aug. 17, 1979, Ser. No. 67,305
Int. Cl.³ G01N *33/54*
U.S. Cl. 23—230 B 20 Claims

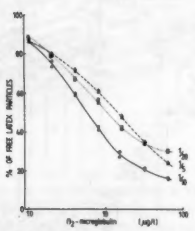
1. A stable reagent for the chemical diagnosis of pathogenic bacterial infections in humans and, in particular, for the qualitative determination of streptococci infections in human serum, the reagent comprising a substantially uniform polystyrene latex particle, said particle being directly adsorbed at a pH between about 8.5 and 10.9 with a cross-linked streptolysin-O protein coating and stabilized with a bacteriostatic agent, said coating being characterised in that it is substantially free from adsorption facilitating extraneous macromolecules.

4,329,152

DETERMINATION OF β_2-MICROGLOBULIN IN HUMAN URINE AND SERUM BY LATEX IMMUNOASSAY

Robert R. Lauwerys, Tervuren, and Alfred M. Bernard, Brussels, both of Belgium, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,268
Int. Cl.³ G01N *33/54, 35/02*
U.S. Cl. 23—230 B 4 Claims



1. A method for determining β_2-microglobulin concentration in a human urine or serum sample comprising the steps of:

(a) coating latex particles with an antibody against the β_2-microglobulin;

(b) incubating the antibody-coated particles diluted in a stabilizing solution with the sample so as to permit the β_2-microglobulin to agglutinate a proportion of the particles, said proportion being related to the concentration of β_2-microglobulin in the sample; and

(c) quantitating the unagglutinated particles and thereby determining the β_2-microglobulin concentration in the sample.

4,329,153

TEST TUBE CONSTRUCTION AND METHOD FOR TESTING FOR COPPER AEROSOLS

Kurt Leichnitz, Gross-Grönau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,551
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942673
Int. Cl.³ G01N *21/78, 31/22*
U.S. Cl. 23—232 R 8 Claims

6. A method of testing for copper aerosols in a gas, using a glass testing tube which has ends which may be opened and with a sealed ampoule of nitric acid therein arranged ahead of a filter and a reaction layer in respect to the flow direction, comprising, directing air to be tested through the glass tube after the ends thereof are broken off to cause any copper particles to be entrained in the filter layer, then breaking the ampoule to cause nitric acid to flow into the filter layer and react with the copper particles and then to flow into the reaction layer, and then comparing the color of the reaction layer to obtain an indication of the quantity of the copper therein.

4,329,154

METHOD OF RECOVERING BORIC ACID

Kanji Shono; Tokio Kitoh; Hiroshi Sano, and Takashi Hironaka, all of Kita-Kyusyu, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Continuation of Ser. No. 829,484, Aug. 31, 1977, abandoned.
This application May 18, 1979, Ser. No. 40,174
Claims priority, application Japan, Aug. 3, 1976, 51-104036
Int. Cl.³ B01D *9/02*
U.S. Cl. 23—301 8 Claims

1. In a method for the recovery of boric acid from the aqueous phase obtained from the hydrolysis of the reaction mixture in which cyclohexane is oxidized in the presence of a boric acid catalyst, the improvement comprising: (a) heating said aqueous phase to concentrate said boric acid by evaporation of water thereby forming a slurry of crystals of boric acid in a mother liquor;

recycling at least a portion of said water to hydrolysis,

(b) separating said crystals from said mother liquor;

(c) concentrating said crystal-free mother liquor by evaporation of water until the mother liquor has a water content ranging from 20 to 50 weight %;

(d) cooling said concentrated mother liquor under reduced pressure which effects evaporation of water thereby crystallizing boric acid from solution;

(e) separating the boric acid crystals from said solution and recycling at least a portion of the boric acid crystals to step (a); (f) concentrating said solution of step (e) from which boric acid crystals have been removed by evaporation of water until the concentrated residue has a water content of less than 5 weight %, and

(g) recovering organic material substantially free of boric acid from the concentrated residue.

4,329,155

PROCESS FOR THE PURIFICATION OF WASTE SULFURIC ACID CONTAINING FLUORIDE

Rainer Schlegel, Hattersheim am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 167,402
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928598
Int. Cl.³ B01D *1/14, 1/30, 3/02;* C01B *17/90*
U.S. Cl. 23—306 5 Claims

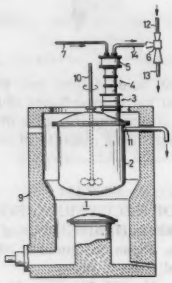
1. A process for purifying 65 to 95 percent strength waste sulfuric acid comprising the steps of:

introducing waste sulfuric acid containing water, organic impurities and 0.02 to 5 percent by weight fluoride into an

acid-resistant plastic tray of an upper section of a stripping column having 1 to 9 trays, the construction components of the tray in the upper section consisting of an acid-resistant plastic, wherein the acid-resistant plastic is selected from the group consisting of polyvinylidenefluoride, polytrifluorochloroethylene, polyphenylenesulfide and polytetrafluoroethylene, on at least the surface of said components contacting acid vapors or liquid acid;

permitting the waste sulfuric acid to flow to 1 to 3 high silicon cast iron trays in a lower section of the stripping column;

heating and concentrating the waste acid in said stripping column;



passsing the heated and concentrated waste acid into boiling concentrated sulfuric acid in a cast iron Paüling kettle at a kettle temperature of 310° to 325° C.; and

condensing sulfuric acid vapors escaping from the kettle by directing the flow of the waste sulfuric acid into the kettle in a countercurrent direction to the sulfuric acid vapors, whereby a purified sulfuric acid is produced;

wherein the ratio of the water content of the waste acid introduced minus the water content of the purified sulfuric acid to the content of the fluoride in the waste acid introduced is not below 10:1.

4,329,156

DESULFURIZATION OF COAL

Donald F. Othmer, 333 Jay St., Brooklyn, N.Y. 11201

Division of Ser. No. 930,327, Aug. 2, 1978, Pat. No. 4,251,227. This application Oct. 1, 1980, Ser. No. 192,731

Int. Cl.³ C10L *9/06, 9/08*

U.S. Cl. 44—1 SR **24 Claims**

1. In a process for removing free and chemically combined sulfur from a solid fuel in the presence of a continuous aqueous phase in an amount of from one to thirty times the dry weight of said fuel, the steps comprising:

(a) reacting said fuel while with water of said continuous aqueous phase in a reaction zone with an oxygen containing gas at a temperature between 175° C. and 325° C. and a pressure of between 10 and 100 atmospheres, wherein;

(i) said fuel is partially oxidized, thereby producing the heat necessary to raise subsequent quantities of said solid fuel with said water and said sulfur to said temperature;

(ii) at least most of said free and chemically combined sulfur is oxidized in the presence of the water in said continuous aqueous phase to sulfuric acid; and

(b) separating at least a part of said continuous aqueous phase from the residue of said solid fuel remaining after said partial oxidation.

4,329,157

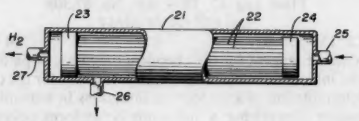
INORGANIC ANISOTROPIC HOLLOW FIBERS

Emerick J. Dobo, Cary, and Tommy E. Graham, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 9,579, Feb. 5, 1979, Pat. No. 4,268,278, which is a division of Ser. No. 906,502, May 16, 1978, Pat. No. 4,175,153. This application Aug. 15, 1980, Ser. No. 178,323

Int. Cl.³ B01D *59/14*

U.S. Cl. 55—16 **10 Claims**



1. In a process for diffusing hydrogen through a hydrogen diffusible non-porous metal barrier, the improvement wherein a hydrogen diffusible metal, monolithic hollow fiber having a radially anisotropic internal void volume wall structure and an essentially non-porous compact layer comprises the non-porous hydrogen diffusible metal barrier.

4,329,158

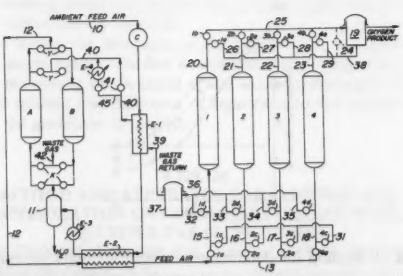
AIR FRACTIONATION BY PRESSURE SWING ADSORPTION

Shivaji Sircar, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 13, 1980, Ser. No. 159,086

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **18 Claims**



1. In the method of producing oxygen-enriched air from ambient air, by pressure swing adsorption scheme, whereby nitrogen is selectively adsorbed on an adsorbent and an oxygen-enriched effluent stream is discharged as primary product, in a system comprising a plurality of main adsorbent beds operated in parallel in timed sequence, the improvement which comprises the following steps carried in recited cyclic sequence:

(1) during an adsorption step introducing the feed air, previously freed of water and CO_2, at elevated temperature and at superatmospheric pressure into a main sorbent bed which is selective for retention of nitrogen and which is operated at near the elevated base temperature of the feed air throughout the bed during the entire cycle, while withdrawing from said bed an unadsorbed oxygen-enriched effluent stream as primary product,

(2) interrupting the introduction of feed air to said bed at the conclusion of said adsorption step and reducing the pressure of the bed by withdrawal therefrom of a secondary gas stream including voids gas and desorbed gas rich in nitrogen, said secondary gas being withdrawn in a direction opposite to that of the initial feed air direction,

(3) purging said bed to remove part of the residual sorbed

nitrogen therefrom when said bed is at the reduced pressure, by passing through the bed counter to initial feed direction a part of the oxygen-enriched product gas which is at the base temperature of the main beds, p1 (4) repressuring the purged bed to an intermediate pressure level between that at step (1) and that at step (3), by flowing into the bed at the air inlet end thereof at least a portion of the secondary gas previously withdrawn from a composition bed at about the base temperature of the main beds,

(5) further repressuring the bed to about the superatmospheric pressure level of step (1) by flowing thereinto a part of the oxygen-enriched product gas, said oxygen-enriched gas being introduced into said bed in a direction counter to that of step (1) above at about the base temperature of the main beds, and

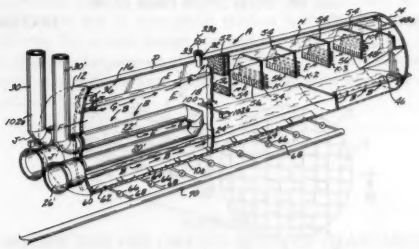
(6) repeating the recited sequence of steps beginning with step (1).

4,329,159

ENERGY SAVING HEAVY CRUDE OIL EMULSION TREATING METHOD AND APPARATUS FOR USE THEREWITH

Hendrix R. Bull, 16861 Saybrook La., Huntington Beach, Calif. 92647

Filed Oct. 22, 1979, Ser. No. 87,559
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—42 **5 Claims**



1. An apparatus for use in separating a viscous emulsion of oil, gas and brine into the components thereof with a minimum of heat energy, said apparatus being of the type that includes an elongate horizontal tank having first and second ends; a plurality of partitions in said tank that subdivide the interior thereof into first, second and third elongate interconnected compartments through which said emulsion sequentially flows; first and second heaters in said first and second compartments that heat said emulsion when therein only to the extent that the viscosity of said emulsion when in said first and second compartments is reduced to the degree that free gas and brine separate from said emulsion when in said first compartment and emulsified gas and a portion of the emulsified brine when in said second compartment, said apparatus being characterized by:

a. a heat controlled means in each of the first and second compartments to regulate the temperature in each compartment to the temperature required to effect the removal of free water and free gas in the first compartment and the removal of emulsified gas and a portion of the emulsified water in the second compartment;

b. a plurality of longitudinally spaced transversely disposed electrodes aligned along a vertical plane within the upper portion of said third compartment that are electrically insulated from said tank;

c. a conductive diffusion plate mounted transversely adjacent said electrodes;

d. first means for supplying high tension electrical energy across said electrodes and said diffusion plate to create a plurality of high electrical potential fields thereabout in which emulsified brine remaining in said emulsion is coalesced into drops thereof that flow to the bottom of said third compartment; and

e. second and third means for removing gas and brine from said third compartment.

5. A method of continuously treating a flow of a viscous emulsion of oil, gas and brine to separate said emulsion into the components thereof with a minimum of energy that includes the steps of:

a. directing said continuous flow of emulsion sequentially through first, second and third zones;

b. heating said emulsion when in said first zone only to the extent that the viscosity thereof is lowered to a degree that free gas and brine separate therefrom;

c. further heating said emulsion when in said second zone only to the extent that the viscosity thereof is further lowered to a degree that a portion of emulsified brine separates therefrom and substantially all emulsified gas therefrom;

d. subjecting said emulsion in said third zone to at least one high potential substantially horizontal electrical field to coalesce emulsified brine remaining therein into drops that flow by gravity to the bottom, with brine and gas free oil due to the lesser gravity rising to the top of the emulsion in said third zone to float as a strata thereon;

e. continuously removing said gas and brine free oil strata as it accumulates in said third zone;

f. continuously removing said gas as it accumulates in said first and second zones and discharging it to the exterior thereof;

g. collecting said brine that separates from said emulsion in said first, second and third zones; and

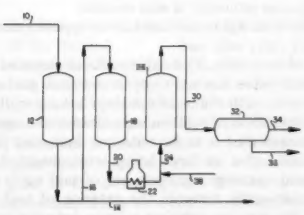
h. comingling and discharging said brine to a desired location.

4,329,160

SUPPRESSION OF COS FORMATION IN MOLECULAR SIEVE PURIFICATION OF HYDROCARBON GAS STREAMS

John D. Sherman, Chappaqua, N.Y., and Arthur T. Katsaros, Macungie, Pa., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 836,001, Sep. 23, 1977, abandoned, which is a continuation of Ser. No. 486,638, Jul. 8, 1974, abandoned. This application Aug. 22, 1978, Ser. No. 935,757
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—62 **2 Claims**



1. A cyclic process comprising the steps of:

(a) an adsorption purification stroke wherein a hydrocarbon stream containing H_2S and CO_2 is contacted in the vapor phase at a temperature of from 60° F. to 120° F. with a molecular sieve adsorbent in a fixed bed to selectively adsorb H_2S and a hydrocarbon product is recovered which is substantially free of H_2S;

(b) a purge desorption stroke wherein a portion of the substantially H_2S-free hydrocarbon product recovered in step (a) is heated to above 120° F. and passed countercurrently through the adsorption bed to desorb substantially

all of the adsorbate molecules selectively adsorbed in step (a) and flush same from the bed;

(c) a cool-down stroke wherein the bed is cooled to below 120° F. by the cocurrent purge therethrough of a portion of the substantially H_2S-free hydrocarbon recovered in step (a) at a temperature of from 60° F. to 120° F.;

the improvement which comprises utilizing as the said molecular sieve adsorbent a crystalline zeolite having a pore diameter of at least 5 Angstroms, at least 45 percent of the framework aluminum atoms thereof being associated with at least one species of alkaline earth metal cation having an atomic number of less than 56, and injecting into said hydrocarbon stream prior to passage through the bed in step (b) a sufficient amount of water vapor to impart a substantially uniform adsorbed water loading of from 0.7 to 3.0 weight percent to the molecular sieve adsorbent.

4,329,161

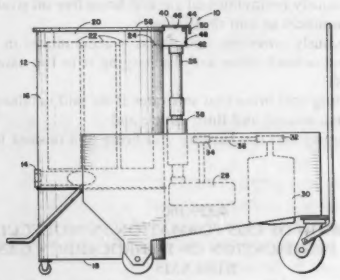
VALVE SYSTEM FOR VACUUM CLEANER

Jack Osborn, 6216 S. Lewis, Tulsa, Okla. 74136

Filed May 18, 1981, Ser. No. 264,870

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—96 **10 Claims**



1. In a vacuum cleaner having a dust-laden air chamber provided with an inlet for dust-laden air and communicating with a dust-free air chamber through a filter element wherein an exhauster communicating with said dust-free chamber through a conduit causes the air to be drawn through the filter element during operation, the improvement comprising a valve system for creating reverse pulses of air through the filter element, the valve system comprising:

(a) a valve axis mounted to said conduit;

(b) a pair of openings in said conduit on opposite sides of said mounted valve axis; and

(c) a pair of essentially rigid valve surfaces mounted to pivot about said valve axis and to open and close said openings in a manner such that said openings are normally closed during operation of said vacuum cleaner and open when accumulated dust is to be removed from said filter element, said valve surfaces being interconnected so that when said openings are open one of said valve surfaces opens outwardly towards the exterior of said conduit against the pressure gradient existing between inside and outside of said conduit during operation of said vacuum cleaner and said other valve surface opens inwardly towards the interior of said conduit assisted by said pressure gradient so that air is admitted through said openings to provide a reverse pulse of air to remove the accumulated dust from said filter element.

9. In a vacuum cleaner having a dust-laden air chamber provided with an inlet for dust-laden air and communicating with a dust-free air chamber through a filter element wherein an exhauster communicating with said dust-free chamber through a conduit causes the air to be drawn through the filter element during operation, the improvement comprising a valve system for creating reverse pulses of air through the filter element, the valve system comprising:

(a) a valve axis mounted to said dust-free air chamber;

(b) a pair of openings in said dust-free air chamber on opposite sides of said mounted valve axis; and

(c) a pair of essentially rigid coplanar valve surfaces mounted to pivot about said valve axis and to open and close said openings in a manner such that said openings are normally closed during operation of said vacuum cleaner and open when accumulated dust is to be removed from said filter element, said valve surfaces being interconnected so that when said openings are open one of said valve surfaces opens outwardly towards the exterior of said dust-free air chamber against the pressure gradient existing between inside and outside of said dust-free air chamber during operation of said vacuum cleaner and said other valve surface opens inwardly towards the interior of said dust-free air chamber assisted by said pressure gradient so that air is admitted through said openings to provide a reverse pulse of air to remove the accumulated dust from said filter element.

4,329,162

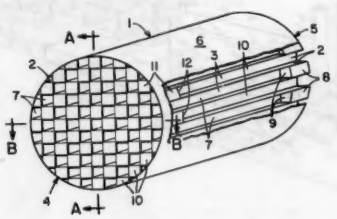
DIESEL PARTICULATE TRAP

Wayne H. Pitcher, Jr., Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,391

Int. Cl.³ B01D *39/20;* **C04B** *21/06*

U.S. Cl. 55—523 **19 Claims**



1. Apparatus for filtering solid particulates from suspension in fluid streams such as exhaust gas from diesel engines, which comprises a filter of honeycomb structure having

a matrix of thin porous walls defining a plurality of cells extending longitudinally and mutually parallel therethrough between inlet and outlet end faces of the structure,

the walls containing substantially uniform interconnected open porosity of a volume and size sufficient to enable the fluid to flow completely through the walls and to restrain most or all of the particulates from passing completely through the walls,

the transverse cross-sectional shapes of the cells forming a substantially uniformly repeating pattern of geometric shapes without interior corner angles of less than 30°,

an inlet group of the cells open at the inlet end face and closed adjacent to the outlet end face,

an outlet group of the cells closed adjacent to the inlet end face and open at the outlet end face,

each cell of the inlet group sharing cell walls only with cells of the outlet group and

each cell of the outlet group sharing cell walls only with cells of the inlet group,

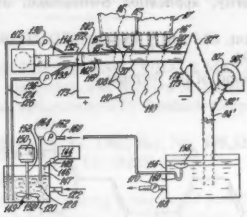
wherein the improvement comprises

the volume of interconnected open porosity and the mean pore diameter of the pores forming the open porosity lying within the area defined by the boundary lines connecting points **1-2-3-4** in FIG. **4**.

4,329,163
METHOD FOR FORMING AND TREATING KINKY FIBERS FROM GLASS

Robert G. Russell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 114,030, Jan. 21, 1980, Pat. No. 4,274,855.
This application Feb. 23, 1981, Ser. No. 237,311
Int. Cl.³ C03B 37/025; C03C 25/02
U.S. Cl. 65—2 5 Claims

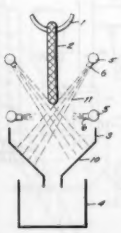


1. The method of forming fibers of heat-softened glass including flowing streams of glass in a row from a feeder, attenuating the streams of glass to fibers, impinging a coherent stream of liquid against the glass streams to effect successive distortions of the glass streams, projecting a second stream of a liquid immiscible with the liquid of the first stream lengthwise of the first stream and in contiguous relation with the first stream whereby the second stream contacts the streams of glass, and cooling the glass streams at the distortions by the first stream of liquid at a rate to form successive permanent bends in the attenuated fibers.

4,329,164
PROCESS FOR THE GRANULATION OF GLASS MELTS

Eberhard Kilian, Hanau, and Georg Schneider, Hasselroth, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 159,853
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924303
Int. Cl.³ C03C 12/00
U.S. Cl. 65—21.2 5 Claims



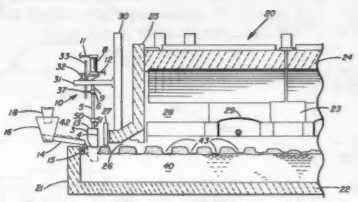
1. A process for granulating a glass melt by contacting said glass melt with water, comprising impacting a vertically downwardly flowing melt all around with high pressure water jets wherein said pressure of said water jets is between 20 and 500 bar and the angle of said high pressure water jets to said vertically downwardly flowing glass melt, down as a conical angle, is between 15° and 180°.

2. A process according to claim 1 wherein the angle of the high pressure water jets is between 60° and 180°.

4,329,165
METHOD FOR ENHANCED MELTING OF GLASS BATCH AND APPARATUS THEREFOR

Frederick C. Rau, McMurray, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 26, 1981, Ser. No. 236,161
Int. Cl.³ C03B 3/00
U.S. Cl. 65—134 11 Claims



1. In the method of producing glass by heating glass batch material in a glass furnace wherein granular glass batch material is introduced onto the surface of a pool of molten glass contained by the furnace and wherein the glass batch is fed into said furnace and floats on the surface of said pool until rendered liquid by heating means within the furnace, the improvement which comprises enhancing the melting rate of the batch material by:

(a) establishing a blanket of glass batch material on the surface of the pool of molten glass at the charging end of the furnace;

(b) providing a plurality of vertically adjustable independently mounted and independently operable tapered pothole-producing members spaced horizontally across the width of the charging end of the furnace and disposed above the glass batch blanket;

(c) adjusting the height of each tapered member above the glass batch blanket so that when lowered the bottom of the tapered members will extend into and below the molten glass a distance about equal to the thickness of the glass batch blanket beneath each member;

(d) lowering the tapered members periodically into the batch blanket and molten glass pool, thereby producing a plurality of potholes in the blanket;

(e) withdrawing the tapered members from the glass batch; and

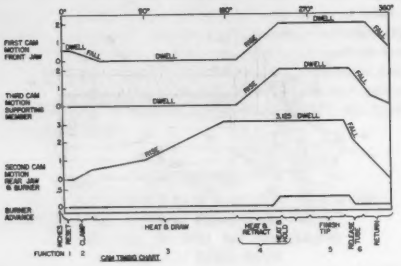
(f) feeding said pothole-containing glass batch into the interior of the furnace.

6. In an apparatus for the manufacture of glass including a glass melting furnace having a heated melting chamber for containing a pool of molten glass, a charging bay extension of the furnace which communicates with the heated melting chamber, glass batch feeder means for feeding a blanket of granular glass batch material onto the surface of the molten pool of glass in the charging bay, a plurality of vertically adjustable, independently mounted and independently operable tapered pothole-producing members spaced horizontally across the width of the charging bay and disposed above the glass batch in the charging bay, vertical reciprocating means for providing vertical reciprocating movement to the tapered members periodically so that the bottom of each such member penetrates into and below the surface of the molten glass a distance about equal to the thickness of the glass batch blanket beneath each such tapered member during its downward movement, mounting means for mounting said tapered pothole-producing members and vertical reciprocating means above the charging bay; and means for cooling the tapered members.

4,329,166
AUTOMATIC TIPPING-OFF APPARATUS FOR A HIGH-INTENSITY-DISCHARGE ARC TUBE

John J. Murphy, Livingston, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 24, 1980, Ser. No. 219,696
Int. Cl.[3] C03B 23/13, 23/18
U.S. Cl. 65—270 5 Claims



1. Tipping-off apparatus for hermetically sealing the exhaust tubulation of a dosed and otherwise processed arc tube for a high-intensity-discharge device, said tipping-off apparatus comprising a portion of a fabricating apparatus for said arc tubes, said fabricating apparatus including a plurality of arc tube holding members each mounted about the peripheral portion of a turret member and being sequentially indexable in a stop-and-go fashion to and from a plurality of operating stations located about the periphery of said turret, said arc tube just prior to being tipped-off comprising an elongated, tubulated body having electrodes operatively positioned proximate the sealed ends thereof with a predetermined discharge-sustaining filling contained within said arc tube body, said arc tube body having an elongated exhaust tubulation projecting laterally therefrom and opening into the interior thereof, said tipping-off apparatus positioned at one of said operating stations and each of said arc tubes upon being indexed into said tipping-off operating station being retained on said turret by its exhaust tubulation with the arc tube body retained in a vertical orientation and with the atmosphere within said arc tube and said tubulation being a small charge of inert ionizable starting gas, said tipping-off apparatus comprising spring-loaded jaw means movable into retaining position on opposite sides of said arc tube, the spring loading on each of said jaw means being slightly different so that absent the retention of said arc tube by its exhaust tubulation, said arc tube would be moved a predetermined distance by said jaw means;

burner means movable into position about the tubulation of said arc tube and operable to heat said tubulation to a softened status at a location proximate the body of said arc tube, and when said tubulation has been sufficiently softened by the heating from said burner means, the spring loading on said jaw means acts to move said arc tube a predetermined distance with respect to said retained tubulation to form a hermetic tip portion of said tubulation;

timing means for controlling the movement of said jaw means and said burner means upon said arc tube being indexed to said tipping-off station;

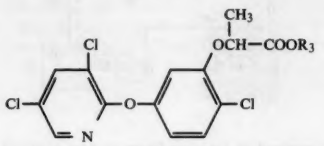
jaw and burner moving means operable by said timing means for moving said jaw means and said burner means from the remainder of said retained exhaust tubulation to effect the complete severing of said retained exhaust tubulation from said hermetic tip portion, and said burner means continuing to heat the severed tip portion of said tubulation proximate said arc tube body to effect a fire polishing thereof and then operable to open said jaw means to release the now sealed arc tube.

4,329,167
PYRIDYLOXY-PHENOXYALKANECARBOXYLIC ACID DERIVATIVES

Hermann Rempfler, Ettingen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 80,965, Oct. 1, 1979, abandoned, which is a continuation of Ser. No. 919,119, Jun. 26, 1978, abandoned. This application Apr. 14, 1980, Ser. No. 140,402
Claims priority, application Switzerland, Jun. 29, 1977, 8023/77
Int. Cl.[3] A01N 43/40; C07D 213/64
U.S. Cl. 71—94 15 Claims

1. A compound of the formula



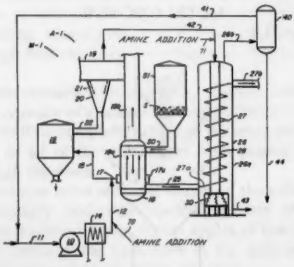
wherein R_3 is hydrogen; an alkali metal cation; ammonium; a C_1–C_4 alkyl ammonium cation whose alkyl moiety is optionally substituted by hydroxy or C_1–C_4 alkoxy; C_1–C_{18} alkyl optionally substituted by halogen, cyano, C_1–C_8 alkoxy, C_2–C_8 alkoxycarbonyl or C_3–C_8 cycloalkyl; C_3–C_{10} alkenyl optionally substituted by halogen; C_3–C_8 alkynyl; C_3–C_8 cycloalkyl; phenyl optionally substituted by halogen or C_1–C_4 alkoxy; or benzyl optionally ring substituted by halogen.

12. A method of controlling weeds at a locus, which comprises applying to said locus a herbicidally effective amount of a compund according to claims **1**, **2**, **3**, **4**, **5** or **6**.

4,329,168
AMINE TREATMENT FOR PASSIVATING SPONGE IRON

Charles A. Rubio, 2600 S. Gessner, Houston, Tex. 77063

Filed Jul. 1, 1980, Ser. No. 165,199
Int. Cl.[3] C23F 11/02
U.S. Cl. 75—0.5 BA 15 Claims



1. A method for reducing the temperature of recently reduced sponge iron to a safe level and inhibiting it against reoxidation, comprising the steps of:

transferring freshly reduced sponge iron in particulate form to a separator vessel, such sponge iron at temperatures dangerously high making it susceptible to undesirable oxidation by contact with air;

passing a cooling gas stream through said sponge iron in order to initially cool and fluidize lighter particles and fines and transferring by fluidization said light particles

and fines from said sponge iron so that heavier solid particles remain;

transferring the remaining sponge iron to a vibratory conveyor and conveying the remaining sponge iron by vibratory motion toward a storage area;

adding an amine containing from about one to about twelve carbon atoms to said cooling gas; and

contacting said cooling gas containing said amine with the remaining sponge iron as it is conveyed by said vibratory motion to a storage area thereby cooling to a safe temperature and inhibiting the reoxidation of the sponge iron.

4,329,169

METHOD FOR PRODUCING COBALT METAL POWDER

Richard G. W. Gingerich, and Richard A. Scheithauer, both of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 18, 1980, Ser. No. 179,332

Int. Cl.³ B22F *9/00*

U.S. Cl. 75—0.5 AA **7 Claims**

1. A method for producing a fine metal powder comprising heating an aqueous solution of soluble cobaltic ammine halide to a temperature of at least 120 degrees centigrade for a sufficient period of time to decompose substantially all of said cobaltic ammine halide to form an amorphous hydrated cobalt oxide containing precipitate, said heating being carried out at a suitable pressure in a sufficiently closed vessel to permit said temperature being attained in said solution, said aqueous solution of soluble cobaltic ammine halide consist essentially from about 5 grams per liter cobaltic ammine chloride based on cobalt present in solution up to the limits of solubility of cobaltic ammine chloride, water, and less than 2 percent by weight impurities based on cobalt present in solution, separating the cobalt containing precipitate from the resulting solution, reducing said cobalt containing precipitate to form fine particles of cobalt.

4,329,170

METHOD OF TREATING SULFUR-CONTAINING METALLURGICAL MATERIALS

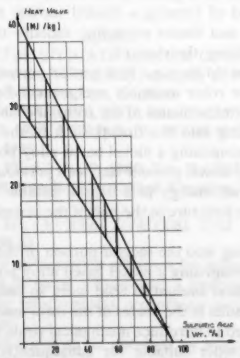
Anton Schummer; Uwe-Jens Hansen, and Michael Kopke, all of Hamburg, Fed. Rep. of Germany, assignors to Norddeutsche Affinerie, Hamburg, Fed. Rep. of Germany

Filed Sep. 11, 1979, Ser. No. 74,299

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1978, 2839794

Int. Cl.³ C22B *15/00*

U.S. Cl. 75—23 **8 Claims**



1. In a method by smelting a sulfur-containing metallurgical intermediate, or sulfide ore or sulfur-containing ore concentrate in the presence of an oxygen-containing gas and with a liquid petroleum fuel combusted at a flame temperature of at least 1500° C. in a combustion zone to form sulfur dioxide and a melt from the metallurgical intermediate, ore or ore concentrate, the improvement which comprises replacing part of said fuel by a calorifically equivalent quantity of sulfuric acid sludge containing at most 85% by weight inorganic constituents and introduced by a lance into the combustion zone.

4,329,171

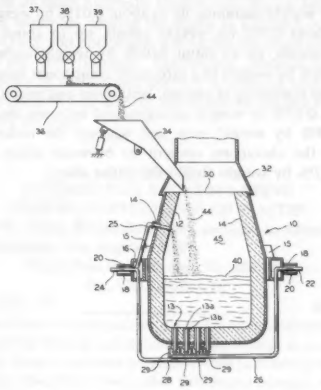
STEEL MAKING METHOD

Edgardo J. Robert, Buenos Aires, Argentina, assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jan. 8, 1981, Ser. No. 223,365

Int. Cl.³ C21C *5/34*

U.S. Cl. 75—51 **1 Claim**



1. A method of producing steel from ferrous hot metal containing carbon, comprising the steps of:

delivering oxygen and a surrounding sheath of hydrocarbon shielding fluid to said metal and beneath its surface to elevate the temperature thereof to about 1350° C.,

delivering pelletized iron material which is at least partially prereduced to said metal at the rate of 0.6–1.5 Kg/ton of liquid steel per minute per each percent of cold charge said pellets tending to lower the temperature of said metal,

delivering carbon to said metal at a controlled rate and simultaneously with the delivery of said pellets, the feed rate of said carbon being such as to maintain the carbon level in said metal at a substantially equilibrium level as the same is oxidized by said oxygen,

terminating the delivery of pellets and carbon to said metal while continuing to deliver oxygen and shielding fluid to reduce the level of carbon therein to a preselected level.

4,329,172

HIGH MANGANESE NONMAGNETIC STEEL HAVING EXCELLENT MACHINABILITY

Chiaki Ouchi, Yokohama, and Tetsuya Sampei, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,363

Claims priority, application Japan, Jan. 8, 1980, 55-697

Int. Cl.³ C22C *38/06*

U.S. Cl. 75—124 **2 Claims**

1. High manganese nonmagnetic steel having excellent machinability consisting essentially of 0.22–0.30% by weight of carbon, 22–28% by weight of manganese, up to 4% by weight of silicon, 0.030–0.10% by weight of sulphur, 0.001–0.008% by weight of calcium, 0.001–0.008% by weight of sol.Al and the balance of iron.

4,329,173

ALLOY RESISTANT TO CORROSION

John H. Culling, Kirkwood, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Mar. 31, 1980, Ser. No. 135,525
Int. Cl.[3] C22C *38/16*
U.S. Cl. 75—125 7 Claims

1. An air-meltable, castable, weldable, nonmagnetic alloy resistant to corrosion in sulfuric acid over a wide range of acid strengths, consisting essentially of between about 18 and about 22% by weight nickel, between about 16.8 and about 19.2% by weight chromium, between about 0.35 and about 1.95% by weight molybdenum, between about 2.5 and about 3.9% by weight copper, between about 3.2 and about 4.7% by weight manganese, between about 0.35 and about 0.80% by weight niobium, up to about 0.7% by weight titanium, up to about 0.4% by weight tantalum, up to about 0.01% by weight boron, up to about 0.5% by weight cobalt, up to about 0.7% by weight silicon, up to about 0.08% by weight carbon, up to about 0.6% by weight of a rare earth component selected from the group consisting of cerium, lanthanum and misch metal, up to about 0.15% by weight nitrogen, and between about 51 and about 58% by weight iron, and wherein the nickel content exceeds the chromium content by between about 0.85 and about 5.2% by weight (basis, the entire alloy).

4,329,174

NICKEL ALLOY FOR SPARK PLUG ELECTRODES

Tsuneo Ito, and Junichi Kagawa, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Sep. 7, 1979, Ser. No. 73,589
Claims priority, application Japan, Sep. 7, 1978, 53-109906
Int. Cl.[3] C22C *19/03*
U.S. Cl. 420—433 6 Claims

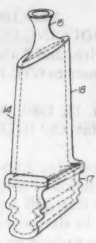
1. A nickel alloy for spark plug electrodes consisting essentially of, in weight percent,
about 0.2 to 3% Si
about 0.5% Mn or less
and additionally containing one of (a), (b) or (c) below
(a) about 0.2 to 3% Cr, and about 0.01 to 1% Y,
(b) about 0.2 to 3% Al and about 0.01 to 1% Y,
(c) about 0.2 to 3% Cr, about 0.2 to 3% Al and about 0.1 to 1% Y, and
the balance nickel.

4,329,175

PRODUCTS MADE BY POWDER METALLURGY AND A METHOD THEREFORE

Neville G. Turner, Bolton, England, assignor to Rolls-Royce Limited, London, England

Continuation of Ser. No. 888,361, Mar. 20, 1978, abandoned.
This application Dec. 5, 1979, Ser. No. 100,788
Claims priority, application United Kingdom, Apr. 1, 1977, 13803/77
Int. Cl.[3] B22F *3/00*
U.S. Cl. 75—208 R 7 Claims



1. A method of forming a turbine blade having a root portion and an aerofoil portion, said method comprising the steps of:
(a) taking a mold having a first portion corresponding to the root portion of the blade and a second portion corresponding to the aerofoil portion of the blade;
(b) introducing into the first portion of the mold a first nickel based alloy powder in a form which will subsequently produce a fine grain structure relative to the aerofoil portion, the particles of the first powder have been previously worked to impart strain energy to the particles to a degree suitable for producing finer grain structure in the root portion of the blade than in the aerofoil portion;
(c) introducing into the second portion of the mold a second nickel based alloy powder which has been worked to the critical amount of cold work so that critical grain growth results in the aerofoil portion of the powder to a degree suitable for subsequently producing a coarse grain structure in the aerofoil portion; and
(d) compacting the powders in the mold by isostatically pressing the mold at a temperature at which a compacted unitary body is formed with coarse grains in the aerofoil portion and finer grains in the root portion.

6. A method of forming a bladed turbine rotor assembly having a hub and blades extending radially therefrom, said method comprising the steps of:
(a) taking a mold having a first portion corresponding to the hub of the rotor assembly and a second portion corresponding to the blades of the rotor assembly;
(b) introducing into the first portion of the mold a metal powder comprising a nickel based alloy powder in atomized form, which powder has been previously worked to impart strain energy to a degree suitable for producing finer grain structure in the hub of the assembly than in the blades;
(c) introducing into the second portion of the mold a metal powder comprising a nickel based alloy powder, worked to the critical amount of cold work so that critical grain growth results in the blades of the rotor assembly, that has been treated to introduce mechanical strain in the particles of the powder suitable for subsequently producing a coarse grain structure in the blades; and
(d) isostatically pressing the mold to compact the powders in the mold at a temperature at which coarse grains are retained in the blades and finer grains are retained in the hub of the rotor assembly.

4,329,176

1,3-BIS-ARYL-GLYCEROL-ETHERS

Heinz Krapf, Grünstadt; Knut Oppenlaender, Ludwigshafen, and Guenter Uhl, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

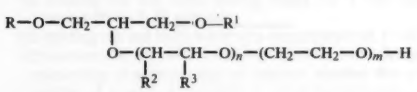
Division of Ser. No. 69,920, Aug. 27, 1979, Pat. No. 4,237,320. This application Feb. 8, 1980, Ser. No. 119,924

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1978, 2839463

Int. Cl.[3] C09D *11/00;* D06B *1/00*

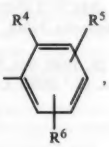
U.S. Cl. 106—19 1 Claim

1. In a process for preparing print pastes consisting essentially of an oil-in-water emulsion of a pigment, a thickening agent, a defoamer, pH-regulator, a softening agent, a water-soluble precondensate and an emulsifier, the improvement which comprises the use as said emulsifier of from 0.1 to 1.5% by weight, based on the finished print paste, of an oxyalkylated 1,3-bis-aryl-glycerol ether of the formula



(I)

where R and R^1 are



α-naphthyl or β-naphthyl and R^4, R^5 and R^6 are —H, C_1–C_{12}-alkyl or

R^2 is $—CH_3$ or $—C_2H_5$, R^3 is —H or $—CH_3$, n is from 0 to 10 and m is from 8 to 50.

4,329,177

ALKALI METAL SILICATE BINDER COMPOSITIONS

Raymond D. George, Milan, Italy, assignor to Foseco International Limited, Birmingham, England

PCT No. PCT/GB80/00026, § 371 Date Oct. 27, 1980, § 102(e) Date Aug. 13, 1980, PCT Pub. No. WO80/01767, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 19, 1980, Ser. No. 205,957

Claims priority, application United Kingdom, Feb. 27, 1979, 7906874

Int. Cl.[3] B28B *7/34;* C08L *3/02*

U.S. Cl. 106—38.35 18 Claims

1. In a binder composition obtained by mixing, in aqueous solution, an alkali metal silicate and a hydrogenated starch hydrolysate, the improvement comprising including urea in said composition.

8. In a binder composition obtained by mixing, in aqueous solution, an alkali metal silicate, a substantially water soluble carbohydrate selected from monosaccharides, disaccharides, polysaccharides and derivatives thereof and an oxyanion salt, the improvement comprising including urea in said composition.

4,329,178

METHOD IN THE MANUFACTURE OF STEAM-CURED LIGHT-WEIGHT AERATED CONCRETE WITH HYDROPHOBIC PROPERTIES

Øystein Kalvenes, Bjärred; Carl-Henry Krill, Malmö; Percy Svensson, Sandby, and Knut Helmersson, Malmö, all of Sweden, assignors to Internationella Siporex Aktiebolag, Malmo, Sweden

Filed Feb. 5, 1980, Ser. No. 118,689

Claims priority, application Sweden, Feb. 15, 1979, 7901373; Oct. 1, 1979, 7908118

Int. Cl.[3] C04B *7/00*

U.S. Cl. 106—87 26 Claims

1. A method in the manufacture of steam-cured light-weight aerated concrete having hydrophobic properties, comprising preparing an aqueous expandable and solidifiable slurry comprising one or more hydraulic binders and one or more silica-containing materials, casting the slurry in a mould; expanding and solidifying, and optionally cutting the solidified slurry; and steam-curing the resultant lightweight aerated concrete, wherein prior to casting said slurry it is admixed with silicone oil in a quantity of 0.05–0.50%, calculated on the dry weight of the starting mixture.

4,329,179

METHOD FOR ENCAPSULATING ARSENIC-CONTAMINATED WASTES

Helmuth W. Kutta, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 5, 1980, Ser. No. 204,140

Int. Cl.[3] C04B *7/02*

U.S. Cl. 106—97 10 Claims

1. A method of encapsulating a solid arsenic-contaminated waste material having sulfur compounds therein in a concrete mixture to form a concrete product which prevents leaching of said arsenic therefrom even after prolonged contact with water, said method comprising:

mixing said solid arsenic-contaminated waste material with a non-Portland, tricalcium aluminate-free hydraulic cement;

adding sufficient water to said arsenic-contaminated material and said non-Portland, tricalcium aluminate-free hydraulic cement to produce a mixture having a consistencey of wet concrete;

mixing an accelerator chemical with said arsenic-contaminated material and said non-Portland tricalcium aluminate-free hydraulic cement before said mixture hardens to quicken the time required for hardening said mixture into said concrete product, said accelerator comprising ferric chloride; and

allowing said mixture to harden under conditions sufficient to cause solidification to thereby form said concrete product.

4,329,180

METHOD AND APPARATUS FOR CALCINING FINE-GRAINED MATERIAL AND FOR GENERATING COAL DUST

Horst Herchenbach, Hennef, and Jakob Ansen, Cologne, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,939

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010909

Int. Cl.[3] C04B *7/02*

U.S. Cl. 106—100 9 Claims

1. In a cement making method in which the cement raw material is subjected to the sequential stages of pre-heating, calcining and sintering, at least one of said stages being fueled by coal dust which has been ground and dried with a drying exhaust gas derived from one of said stages, the improvement which comprises:

withdrawing an exhaust gas fraction having a relatively high

concentration of injurious substances such as alkalis and sulfur from one of said stages,

cooling the withdrawn exhaust gas fraction,

substantially removing the injurious substances from the cooled gas fraction, and

utilizing the resulting gas fraction to dry the aforementioned coal dust.

4,329,181

METHOD FOR PREPARING ALKALINE CORRUGATING ADHESIVE

Chung-Wai Chiu, Westfield, and Walter J. Krieg, Princeton, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Oct. 14, 1980, Ser. No. 196,812
Int. Cl.³ C08L *3/06, 3/04;* C09J *3/06*
U.S. Cl. 106—213 **7 Claims**

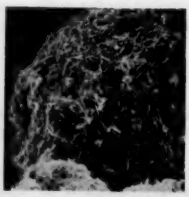
1. A method for preparing an alkaline corrugating adhesive which comprises, as a first step, providing a carrier starch by cooking in a continuous pressure cooker an aqueous slurry of a granular starch derivative having a total amylose content of at least about 40% by weight and a degree of substitution of alkali-labile stabilizing groups of at least about 0.01, wherein said cooking is conducted at a temperature of at least about 80° C. for a period of time sufficient to disrupt totally the granular structure of the starch, and, as a second step, incorporating said carrier starch into an alkaline corrugating adhesive, such that the alkali-labile groups of said carrier starch are hydrolyzed in situ to regenerate the starch in unsubstituted form so as to provide sufficient tack in said adhesive.

4,329,182

GRANULAR STABILIZER FOR CHLORINE-CONTAINING POLYMERS

Yujiro Sugahara, Tokyo; Hiroyuki Naito, Tsuruoka; Mamoru Saito, Tsuruoka, and Hisashi Tuchida, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1980, Ser. No. 196,549
Int. Cl.³ C08L *91/00*
U.S. Cl. 106—243 **5 Claims**



1. A granular stabilizer for chlorine-containing polymers, which comprises porous spherical particles composed of randomly integrated needle crystals of a polybasic sulfuric acid/-fatty acid lead salt having a chemical composition of 1 mole of SO_3, 3.7 to 4.5 moles of PbO and 0.06 to 1.27 moles of a higher fatty acid and also having X-ray diffraction peaks at spacings d of 2.95 Å and 3.27 Å, wherein the fatty acid component is enrolled in the surfaces of the respective needle crystals without substantial phase separation in the surfaces of the spherical particles.

4,329,183

DECATIONIZATION OF AQUEOUS SUGAR SOLUTIONS

Gerard Rousseau, Ham, and Claude Lamotte, Juan les Pins, both of France, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 30, 1980, Ser. No. 154,656
Int. Cl.³ C13D *3/14*
U.S. Cl. 127—46.2 **5 Claims**

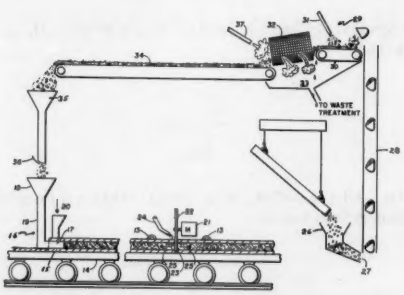
1. A process for the decationisation of an aqueous sugar solution wherein the solution is passed into contact with ion exchange resin in a batch reaction, agitated therewith and separated therefrom and wherein the resin consists essentially of a mixture of weakly acidic cation exchange resin in the hydrogen form and weakly basic anion exchange resin, the temperature is from 20° to 90° C. and the resin is in contact with sugar solution for about 60 to 90 minutes.

4,329,184

ROCK AGGREGATE CORE MATERIAL WASHING AND RECYCLING

David W. Hanson, Minneapolis, Minn., assignor to Fabcon, Inc., Savage, Minn.

Filed Jun. 20, 1980, Ser. No. 161,456
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—18 **6 Claims**



1. A process for recovery and recycling of hard rock aggregate used in forming of hollow-core prestressed concrete planks wherein the hard rock aggregate from a slip form core material reservoir has been deposited into longitudinally positioned voids formed by a slip form within a plastic concrete plank and has acted to hold the plastic concrete in place while the concrete is cured and subsequently cut to desired length plank sections with a water lubricated saw that creates a finely divided saw slurry of concrete which coats said aggregate, comprising:

(a) dumping said coated hard rock aggregate from said plank sections into a collection means;

(b) delivering a stream of said coated aggregate from said collection means into the path of a jet of wash water of sufficient velocity and volume to substantially remove the saw slurry from the surface of said aggregate;

(c) draining the wash water and entrained slurry material from said aggregate; and,

(d) transporting the washed aggregate to the slip form core material reservoir for ultimate reuse in the forming of hollow cores in concrete planks.

4,329,185
METHOD FOR THE PREPARATION OF A BIOLOGICALLY ACTIVE POLYAMIDE NET

Kiril D. Dimov; Nikolay B. Vassilev; Dimiter G. Dimitrov; Ekaterina I. Terlemezyan; Angelina H. Georgieva, and Borislav A. Dimitrov, all of Sofia, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

Filed Jan. 21, 1981, Ser. No. 226,757
Int. Cl.[3] B08B 30/00
U.S. Cl. 134—26 2 Claims

1. Method for the preparation of a biologically active polyamide net for insertion in the human body by means of a surgical intervention which comprises sequentially treating a knit of polyamide fibers of 5–10 Tex thickness and up to 500 twists per meter with cell dimensions of the order of 1.0/1.5×1.2/2.0 mm by:

(a) washing said net with a nonionogenic medium at a temperature of from 20°–90° C. for a time period of from 5–30 minutes;

(b) treating the net with boiling water for a time period ranging from 5–30 minutes;

(c) treating the net with water at a temperature of 1°–30° C.;

(d) treating the net with a solvent selected from the group consisting of acetone and an organic alcohol for a time period of from 5–30 minutes at room temperature while mixing the solvent;

(e) washing the net with distilled water and draining it up to 50 percent residual humidity;

(f) treating the net at a temperature within the range of 20°–90° C. for a time period ranging from 5–120 minutes with a non-allergenic, non-toxic and non-carcinogenic antibacterial composition selected from the group consisting of:

(1) derivatives of 8-oxyquinoline;

(2) derivatives of 8-oxyquinaldine;

(3) nitrofuranic derivatives; and

(4) metal salts of derivatives of 8-oxyquinolines, derivatives of 8-oxyquinaldines, or nitrofuranic derivatives.

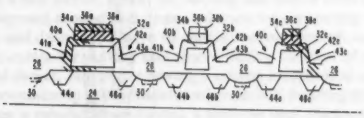
(g) washing the net with water at 5°–30° C. for a time period ranging from 5–30 minutes, and

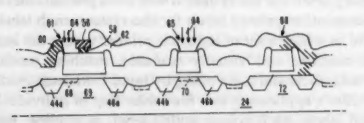
(h) drying the treated net at a temperature ranging from 20°–100° C. up to a residual humidity ranging from 2–5 percent.

4,329,186
SIMULTANEOUSLY FORMING FULLY IMPLANTED DMOS TOGETHER WITH ENHANCEMENT AND DEPLETION MODE MOSFET DEVICES

Harish N. Kotecha, Essex Junction, Vt., and Francisco H. DeLaMoneda, Stormville, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,673
Int. Cl.[3] H01L 21/26, 7/44, 21/28
U.S. Cl. 148—1.5 4 Claims





1. A process for forming an FET device with a precisely defined channel length on a silicon substrate of a first conductivity type on which is deposited a first layer of silicon dioxide, a layer of polycrystalline silicon, a second layer of silicon dioxide, a layer of silicon nitride and a third layer of silicon dioxide, comprising the steps of:

etching said polycrystalline silicon layer, said second oxide layer, said nitride layer and said third oxide layer to form a composite gate structure having a first edge and a second edge defining a channel region for said FET device;

depositing source and drain regions of a second conductivity type opposite to said first conductivity type, aligned with said first and second edges, respectively, in said substrate;

laterally etching said silicon nitride layer beneath said third silicon dioxide layer, forming a reduced size silicon nitride layer having third and fourth edges displaced by a predetermined amount with respect to said first and second edges, respectively;

ion implanting a first conductivity type impurity in said channel region of said substrate having a first end connected to said source region and a second end whose location is juxtaposed with said third edge of said silicon nitride layer, forming an enhancement mode portion of said channel region having a predetermined threshold voltage;

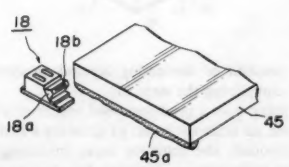
implanting ions of said second conductivity type in said channel region of said substrate having a first end connected with said drain region and a second end whose location is juxtaposed with said fourth edge of said silicon nitride layer, forming a depletion region drain extension in said channel region;

whereby a precisely defined effective channel length is created between said source region and said drain extension.

4,329,187
APPARATUS AND METHOD FOR CUTTING CONTINUOUS METAL SHEET BY MELTING PORTION THEREOF AND TRIMMING END OF CUT SHEET

Bunnosuke Ushioda, Hoya, and Nobuyasu Nakamura, Yokohama, both of Japan, assignors to Nippon Speng Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1980, Ser. No. 213,686
Claims priority, application Japan, Dec. 29, 1979, 54-170818; Dec. 29, 1979, 54-170819; Mar. 19, 1980, 55-35040
Int. Cl.[3] B23K 7/02, 7/08
U.S. Cl. 148—9 R 13 Claims



1. A trimming apparatus for removing a slag formed on an end of a sheet segment which has been cut from a continuous metal sheet by melting a localized area thereof, said apparatus comprising:

(a) means for advancing the sheet segment; and

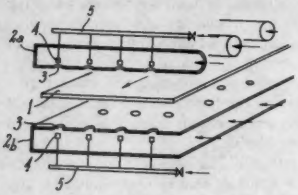
(b) a trimming mechanism including a carriage movable along the path of travel of the sheet segment, and a burner mounted on said carriage and movable along the end of the sheet segment to remove the slag therefrom.

4,329,188

METHOD FOR COOLING METAL ARTICLES

Robert Wang, Wissous, France, assignor to Heurtey Metallurgie, Paris, France

Filed Jan. 15, 1980, Ser. No. 112,187
Int. Cl.[3] C21D *1/18*
U.S. Cl. 148—143 **9 Claims**



1. A method of cooling continuously moving metal articles, said method comprising:

projecting a conical jet of gas at a low pressure of less than 15000 Newton/m^2 toward a continuously moving metal article to be cooled; and

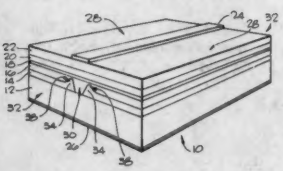
injecting a conical jet of liquid into said conical jet of gas at a position chosen such that liquid particles of said jet of liquid are broken into finer particles by friction and are distributed into the entire volume of said jet of gas, thereby forming therein a mist which is projected onto said article to be cooled.

4,329,189

CHANNELLED SUBSTRATE DOUBLE HETEROSTRUCTURE LASERS

Julian P. Noad, Carp; Anthony J. Springthorpe, Richmond, and Christopher M. Look, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 118,653, Feb. 4, 1980. This application Jul. 13, 1981, Ser. No. 282,863
Int. Cl.[3] H01L *21/20*
U.S. Cl. 148—171 **6 Claims**



1. A method of fabricating layered structure III-V compounds comprising the steps of:

depositing over a predetermined region of a flat III-V substrate, an inhibitor layer; p1 growing a first layer of III-V compound, the inhibitor layer inhibiting such growth from occurring on its top surface but the growth occurring preferentially immediately adjacent the inhibitor layer;

stripping said inhibitor layer;

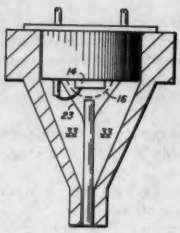
and growing a second layer of III-V compound using a deposition process characterized by preferential deposition of III-V compound in lower-lying regions of the substrate, whereby to produce a uniform thickness combination layer of said first and second layers in which the junction of first and second layers is non-planar.

4,329,190

PROCESS FOR ATTACHING OPTICAL FIBER TO SEMICONDUCTOR DIE

Howard M. Berg, Scottsdale, and Gary L. Lewis, Peoria, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1979, Ser. No. 45,903
Int. Cl.[3] G02B *7/26;* H01L *31/12*
U.S. Cl. 156—60 **10 Claims**



1. A method for attaching an optical fiber to a semiconductor device comprising the steps of:

coating a semiconductor die with an uncured polymer and partially curing said coating;

applying a droplet of uncured polymer to the end of the optical fiber to be attached to said die;

bringing said coating and said droplet into contact so that said droplet spreads over said coating;

partially curing said droplet insitu; and

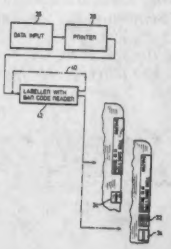
fully curing said droplet and coating.

4,329,191

SYSTEM FOR ALPHABETICALLY LABELLING ARTICLES

Donald T. Barber, Toronto, Canada, assignor to Datafile Limited, Willowdale, Canada

Continuation-in-part of Ser. No. 922,187, Jul. 5, 1978, Pat. No. 4,240,848. This application Oct. 24, 1980, Ser. No. 200,517
The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.
Int. Cl.[3] B32B *31/10;* B65C *1/04;* G09F *3/02*
U.S. Cl. 156—64 **10 Claims**

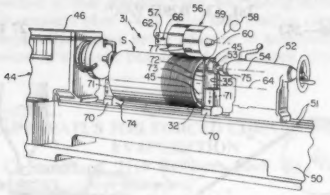


1. A process for labelling a system of file folders comprising printing labels for the system where each printed label is different from other printed labels for the system, each label having a field in which a set of indicia is printed where the indicia are both machine and visually readable, machine reading such printed indicia and controlling by input from such reading step a labeller's application to a file folder flap of individual colour coded labels, each colour coded label, as applied, having an indicium corresponding to selected ones of the machine read indicium.

4,329,192
APPARATUS AND METHOD FOR MAKING A BELT CONSTRUCTION

Jack D. White, Jr., Springfield, and Melvin D. Gayer, Everton, both of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Jan. 19, 1981, Ser. No. 226,285
Int. Cl.³ B29H 7/22
U.S. Cl. 156—138 **26 Claims**



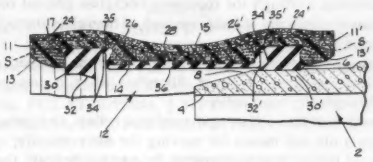
1. In a method for making a belt construction having a plurality of alternating annular belt projections and grooves along its axial length; said method comprising the steps of; building a tubular uncured structure around a building drum which has a central longitudinal axis; curing said structure to define a belt sleeve; cooling said sleeve with said sleeve disposed around said drum; supporting and rotating said drum and sleeve on a device to enable cutting thereof; and cutting said sleeve with a rotatable cutter which has a central longitudinal axis and during rotation of said drum and sleeve; the improvement in said method wherein said building step comprises; building said structure around a tubular drum having a uniform wall thickness, a right circular cylindrical inside surface, and open ends; and said supporting and rotating step comprises supporting said drum and sleeve on said device which comprises a plurality of rotatable support shafts including a driving shaft by disposing said shafts within said hollow open ended drum and into pressure engagement against said inside surface to support said drum, the axes of the support shafts being spaced from the axis of the drum, rotating said driving shaft with a drive and with said shafts in pressure engagement against said inside surface to provide rotation of said drum and sleeve, and controlling said cutter with cutter control means during rotation of said cutter and drum to provide a cutting action which defines said belt construction having said alternating projections and grooves which are precisely made.

12. In an apparatus for making a belt construction having a plurality of alternating annular belt projections and grooves along its axial length; said apparatus comprising; a building drum for building a tubular uncured structure, said drum having a central longitudinal axis; means for curing said structure to define a belt sleeve; means for cooling said sleeve with said sleeve disposed around said drum; a device for supporting and rotating said drum and sleeve to enable cutting thereof; and a rotatable cutter for cutting said sleeve during rotation of said drum and sleeve, said cutter having a central longitudinal axis; the improvement in said apparatus wherein said building drum comprises; a tubular drum having a uniform wall thickness, a right circular cylindrical inside surface, and open ends; and said device comprises; a plurality of rotatable support shafts including a driving shaft, said shafts being adapted to be disposed within said hollow open ended drum and into pressure engagement against said inside surface to support said drum, the axes of the support shafts being spaced from the axis of the drum, a drive for rotating said driving shaft with said shafts in pressure engagement against said inside surface to provide rotation of said drum and sleeve, and cutter control means for controlling said cutter during rotation of said cutter and drum to provide a cutting action which defines said belt construction having said alternating projections and grooves which are precisely made.

4,329,193
METHOD OF MAKING A COUPLING FOR RIGID PRESSURE PIPE

John L. Sznopek; Charles Lostak; Robert W. Heisler; Joseph P. Ferraro, and Henry J. Kazienko, all of Littleton, Colo., assignors to Manville Service Corporation, Denver, Colo.

Division of Ser. No. 918,226, Jun. 23, 1978. This application Mar. 31, 1980, Ser. No. 135,566
Int. Cl.³ B65H 81/00; F16L 21/02
U.S. Cl. 156—162 **8 Claims**

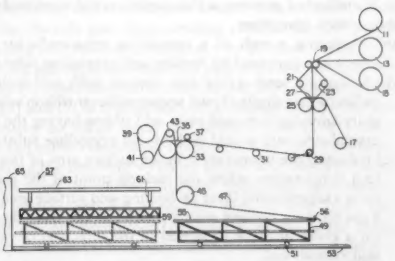


1. In a method of forming a coupling for pipe including:
(a) forming a rubber sleeve having gasket means for sealingly engaging the ends of adjacent lengths of pipe;
(b) supporting said sleeve on a mold mandrel;
(c) forming a fiber reinforced resin body around and in intimate contact with said sleeve; and
(d) curing said body around and in intimate contact with said sleeve at elevated temperatures to form a coupling capable of supporting said liner during sealing engagement with said pipe, the improvement comprising:
supporting said sleeve on said mandrel by stretching said sleeve by a predetermined degree in order to place said sleeve under a circumferential stress so as to reduce the cross-sectional area of said sleeve to substantially compensate for the displacement of the then curing resin body caused by the thermal expansion of said sleeve during said curing step whereby dimensional discrepancies are substantially prevented.

4,329,194
METHOD FOR CONSTRUCTING FIBERGLASS ARTICLES

Andrew Green, Galveston; Charles W. Rogers, Hurst, and Clarence D. Upton, Azle, all of Tex., assignors to Composite Technology, Inc., Fort Worth, Tex.

Filed Aug. 18, 1980, Ser. No. 178,963
Int. Cl.³ B32B 1/00, 17/00
U.S. Cl. 156—179 **16 Claims**



1. A method of constructing a fiberglass member, comprising:
drawing a web of fiberglass through a bath of structural resin to impregnate the fiberglass with the structural resin;
drawing a web of organic, porous veil material through a bath of gelcoat resin containing ultraviolet stabilizer and

pigment, simultaneously with the structural resin impregnated web of fiberglass, and pressing the webs of the veil material and fiberglass together to create a composite web having a layer of structural resin and a layer of gelcoat resin; then

placing the composite web on a mold to shape the member, then curing.

14. An apparatus for making fiberglass members, comprising in combination:

a pair of resin rollers, having ends partially closed for defining a trough for receiving fiberglass structural resin;

a pair of gelcoat rollers, having ends partially closed for defining a trough for receiving fiberglass gelcoat resin;

means for drawing at least one web of fiberglass through the resin rollers;

means for drawing a web of veil through the gelcoat rollers along with the web of fiberglass after it has passed through the resin rollers;

a press mounted adjacent the gelcoat rollers, the press having a die and means for moving the die vertically;

a mold having transport means for passing beneath the gelcoat rollers and beneath the press for receiving the die; and

an oven adjacent the press for receiving and heating the mold.

4,329,195

LATERAL PULLING GROWTH OF CRYSTAL RIBBONS

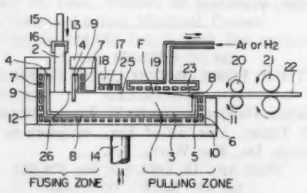
Bosshi Kudo, Nagareyama, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha and Toyo Silicon Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 705,353, Jul. 14, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,480

Claims priority, application Japan, Jul. 28, 1975, 50-91099; Aug. 20, 1975, 50-100112; Nov. 14, 1975, 50-136840; Jan. 22, 1976, 51-5462; Jan. 28, 1976, 51-7474

Int. Cl.[2] **B01J** *17/18*

U.S. Cl. 156—617 SP **31 Claims**



1. A method of growing a thin single crystal semiconductor ribbon which comprises

(a) producing a melt of a crystalline semiconductor substance in a container by heating said crystalline substance,

(b) bringing a seed crystal into contact with said melt and pulling a thin single crystal semiconductor ribbon substantially laterally from said melt, said ribbon having the same crystal structure as said melt of said crystalline substance,

(c) reducing the temperature in the surface area of the melt to a temperature below the melting point of the melt to form a supercooled layer by cooling said surface area with a gas blowing cooling means which extends over the melt for a given distance measured in the direction of pulling said ribbon, and

(d) adjusting at least one of (i) said heating of said melt and (ii) the amount of said cooling, to produce a substantially wedge-shaped crystal growing domain located substantially completely under said cooling means and within said given distance, and having a length L from its front leading edge to its back edge B such that the ratio of said length L to the thickness of the resulting ribbon is not less then 50, and pulling said single crystal ribbon at a rate of at least 300 mm/min.

4,329,196

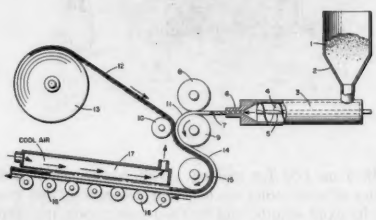
METHOD OF MAKING A THREE-DIMENSIONAL LAMINATE

George R. Rawlinson, Ferguson, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 16, 1979, Ser. No. 67,205

Int. Cl.[3] **B29D** *9/00*

U.S. Cl. 156—243 **27 Claims**



1. A method for producing a three-dimensional laminate substantially free of thermal distortion, said method comprising:

(a) continuously feeding a normally solid adhesive layer between a heat-sensitive, unfoamed three-dimensional layer and a near molten thermoplastic substrate sheet to form a three-layer laminate, the temperature of said substrate being sufficiently above the melting temperature of said adhesive layer to effect the fusion bonding of said substrate in said three-dimensional layer;

(b) simultaneously inhibiting the loss of heat from the exposed surface of said substrate to balance the heat flow from opposing surfaces of said substrate; and

(c) maintaining a balanced heat flow from the opposing surfaces of said substrate as said laminate cools.

4,329,197

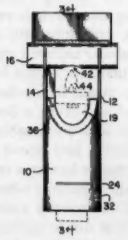
PLASTIC BAG SEALER

Leon G. Robles, 2740 Prune Ridge Ave., Santa Clara, Calif. 95051

Filed Jul. 21, 1980, Ser. No. 170,578

Int. Cl.[3] **B32B** *31/00*; **B30B** *5/02*; **F24C** *3/00*; **B44B** *7/02*

U.S. Cl. 156—583.4 **8 Claims**



1. A portable plastic bag sealer utilizing a lighter as a heat source and comprising:

a. A support structure including a body portion having an upper end and provided with a void receptive to a lighter, means for clamping at least a part of said body portion around said lighter so that a flame produced by said lighter is proximate said upper end, and a bracket portion coupled to said body portion and extending away from said upper end;

b. A tubular heating element supported horizontally relative

an upper and a lower surface of said lighter by said bracket portion in proximity to said upper end of said body portion, said tubular heating element having a centrally located hole for receiving a flame of said lighter and having a heated surface when said lighter is producing a flame; and

c. Compression means including an elongated lever arm pivotally attached to said bracket portion, a pressure plate attached to said lever arm, a heat resistant pressure pad attached to said pressure plate, and spring means biasing said pressure plate away from said heating element, said compression means being adapted to selectively press a portion of a plastic bag against said heated surface.

4,329,198

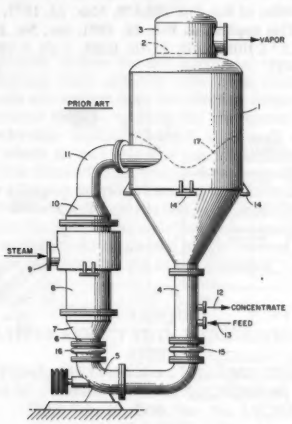
APPARATUS FOR FORCED CIRCULATION EVAPORATION

Ferris C. Standiford, 2713 S. North Bluff Rd., Greenbank, Wash. 98253

Continuation-in-part of Ser. No. 612,736, Sep. 12, 1975, abandoned. This application Oct. 14, 1980, Ser. No. 196,572

Int. Cl.³ B01D *1/12*

U.S. Cl. 159—6 R **8 Claims**



1. A forced circulation evaporator apparatus for removing as vapor part of a liquid contained in a feed stream charged to said apparatus which comprises:

(a) an elongated vessel having a stationary upper, imperforate intermediate and lower portion thereof possessing (i) a vapor outlet in said upper portion; (ii) a liquid outlet in said intermediate portion; and (iii) a hot gaseous inlet and a liquid phase feed inlet in said lower portion;

(b) a stationary plurality of heat transfer passage conduits situated in said lower portion of said vessel and substantially parallel to the longitudinal axis of said vessel wherein said plurality of heat transfer conduits initiate in the lower portion of said vessel and terminate in the intermediate portion of said vessel for passage of a vapor phase-liquid phase admixture therethrough, said admixture being heated by indirect heat exchange with a hot gaseous stream entered in said hot gaseous inlet situated in said lower portion of said vessel;

(c) an impeller situated within said intermediate portion of said vessel, said impeller possessing a shaft situated substantially parallel to said plurality of heat transfer passage conduits, a plate situated above the point at which said heat passageway conduits terminate and at least one blade attached to either or both of said shaft and plate; and

(d) a movement means for turning said impeller to form a conical-shaped liquid phase along the interior of the walls of said intermediate portion of said vessel to effect discharge of said liquid phase through said outlet opening in the uppermost portion of said intermediate zone, said outlet opening being situated above said impeller blade and plate and wherein said impeller movement causes said vapor in said vapor phase-liquid phase admixture to rise above the surface of said liquid phase and exit said forced circulation evaporator apparatus through said vapor outlet situated in said upper portion of said vessel.

4,329,199

PROCESS FOR DIGESTING AND BLEACHING CELLULOSIC MATERIAL WITH REDUCED EMISSIONS

Per-Erik Andersson, and Fall E. I. Eriksson, both of Sundsvall, Sweden, assignors to SCA Development Aktiebolag, Sweden

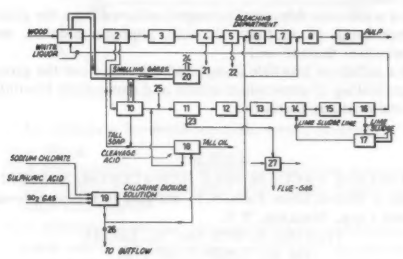
PCT No. PCT/SE79/00046, § 371 Date Dec. 7, 1979, § 102(e) Date Nov. 15, 1979, PCT Pub. No. WO79/00899, PCT Pub. Date Nov. 15, 1979

PCT Filed Mar. 2, 1979, Ser. No. 177,764

Claims priority, application Sweden, Apr. 7, 1978, 7803920

Int. Cl.³ D21C *3/02, 11/04, 11/08, 11/12*

U.S. Cl. 162—19 **9 Claims**



1. A method for the digesting and bleaching of cellulose-containing material wherein the emissions therefrom and the demand for fresh chemicals therefor are reduced, said method comprising the steps of (1) digesting cellulose-containing material in a digestion liquor containing sulfur and sodium, to thereby produce a digested pulp mixture and gases containing sulfur compounds, (2) removing said gases containing sulfur compounds from said digestion step; (3) combusting said gases containing sulfur compounds produced in the digestion step so as to convert sulfur therein to sulfur dioxide gas; (4) separating the digested pulp mixture into digested pulp and a waste liquor; (5) combusting said waste liquor so as to convert sulfur therein to sulfur dioxide gas; (6) generating chlorine dioxide gas and producing acid residual solution as a by-product therefrom; (7) bleaching said separated digested pulp with said chlorine dioxide gas; (8) absorbing sulfur dioxide gas from said combusting steps (3) and (5) in a scrubber containing an absorption liquor comprising an alkali metal salt solution substantially free of sulfur and sulfur compounds to thereby form a scrubber liquor; (9) mixing the resulting scrubber liquor with the acid residual solution from the chlorine dioxide generating step, whereby sulfur dioxide gas and a residual solution free from sulfur dioxide gas are produced; (10) separating the sulfur dioxide produced in step (9) from said residual solution free from sulfur dioxide; (11) precipitating non-chloride alkali metal salts from said residual solution free from sulfur dioxide to thereby obtain a sulfuric acid solution containing chloride; and (12) recycling said residual sulfuric acid solution containing chloride from step (11) to said chlorine dioxide generating step (6), whereby the chloride content of said residual sulfuric acid solution is utilized.

4,329,200
METHOD AND SYSTEM FOR SELECTIVE ALKALINE DEFIBERIZATION AND DELIGNIFICATION

Kyosti V. Sarkanen, Seattle, Wash., assignor to Board of Regents, University of Washington, Seattle, Wash.

Filed Jun. 2, 1980, Ser. No. 155,244
Int. Cl.³ D21C *3/20*
U.S. Cl. 162—77 **17 Claims**

1. A method for selectively producing a substantially fiberized, substantially delignified, high yield cellulosic pulp, which comprises

(a) forming an aqueous pulping system comprising lignocellulose, a pulping liquor including water and a pulping agent, said pulping agent comprising a water-miscible organic reagent selected from the group consisting of aliphatic alcohols, aliphatic ketones, and mixtures thereof, and a sulfide or bisulfide compound selected from the group consisting of ammonium sulfide and ammonium bisulfide, and mixtures thereof; and

(b) pulping said lignocellulose at an elevated temperature for a time sufficient to selectively produce said substantially fiberized, substantially delignified cellulosic pulp.

10. An aqueous pulping system capable of selectively producing a substantially fiberized, substantially delignified, high yield, cellulosic pulp, which comprises

(a) lignocellulose;

(b) water;

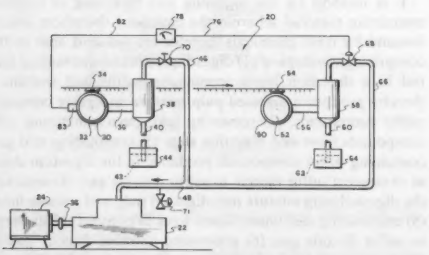
(c) a water-miscible organic reagent selected from the group consisting of aliphatic alcohols, aliphatic ketones, and mixtures thereof; and

(d) a sulfide or bisulfide compound selected from the group consisting of ammonium sulfide and ammonium bisulfide, and mixtures thereof.

4,329,201
CONSTANT VACUUM FELT DEWATERING SYSTEM

Joseph A. Bolton, Glens Falls, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Dec. 6, 1979, Ser. No. 100,814
Int. Cl.³ D21F *11/00, 1/48*
U.S. Cl. 162—198 **12 Claims**



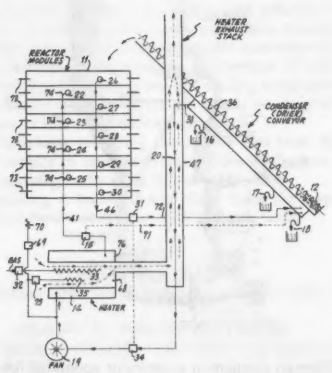
1. A constant vacuum felt dewatering system comprising; a first and a second suction pipe each having a slot therein, a felt positioned to pass over the slots, vacuum means including a positive displacement pump which provides a relatively constant volume of air flow at the pump, conduit means connecting the suction pipes to the vacuum means, means to advance the felt over the pipes whereupon vacuum is applied thereto to dewater the felt, and means for sensing a demand for increased vacuum and control means for maintaining a substantially constant vacuum under varying air flow conditions through the felt including an automatic control valve positioned in the conduit means between the second suction pipe and the vacuum means, a vacuum controller connected to the control valve, and wherein the means for sensing the demand for increased vacuum is operatively connected to the first suction pipe and the vacuum controller.

6. A constant vacuum felt dewatering system comprising; first and second suction pipes each having a slot therein, a felt positioned to pass over the slots, vacuum means including a positive displacement pump which provides a relatively constant volume of air flow at the pump, conduit means connecting the suction pipes to the vacuum means, means to advance the felt over the suction pipes whereupon vacuum is applied thereto to dewater the felt, means for sensing a demand for increased vacuum and means responsive to the sensed demand for increased vacuum for automatically controlling slot width adjustment and/or arrangement to vary the dwell time in order to maintain a substantially constant vacuum under varying air flow conditions through the felt, the second suction pipe having means for adjusting the slot width, slot drive means attached to said adjusting means to open and close the slot as desired, said sensing means connected to the slot drive means and to the first suction pipe.

4,329,202
CONTINUOUS HEATING PROCESS FOR PRODUCING CHAR FROM CELLULOSIC MATERIAL

Eugene W. White, State College; Francis M. Gross, and Fred E. Knoffsinger, both of Pleasant Gap, all of Pa., assignors to Enerco, Inc., Langhorne, Pa.

Continuation of Ser. No. 972,392, Dec. 22, 1978, abandoned, which is a division of Ser. No. 780,679, Mar. 23, 1977, Pat. No. 4,165,216. This application Feb. 18, 1981, Ser. No. 235,764
Int. Cl.³ C10B *27/02, 53/02;* **C10L** *5/44, 9/08*
U.S. Cl. 201—27 **6 Claims**



1. A process for producing charcoal or char material from cellulosic material, such as wood chips, sawdust, and the like, which comprises passing cellulosic feed material through a heating and charring zone, directly and uniformly contacting the cellulosic feed material within the heating and charring zone with hot gases introduced via input means arranged and constructed to disperse the hot gases within and substantially throughout the entire zone at a substantially uniform temperature in the range 750° to 1000° F. to produce charcoal or char material and to generate combustible gas, withdrawing from the heating and charring zone charcoal or char material produced and separately withdrawing hot gases including generated combustible gas via output means arranged and constructed to collect the gases from within and substantially throughout the entire zone, heating the withdrawn hot gases to said temperature in the range 750° to 1000° F., introducing the resulting heated hot gases into the heating and charring zone in direct and uniform contact with additional cellulosic feed material to generate therefrom additional combustible gas and additional charcoal or char material, withdrawing the additional charcoal or char material and the resulting gases containing additional combustible gas, removing a portion of the withdrawn gases, combusting the removed portion of the withdrawn gases to produce hot combustion gases and em-

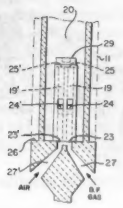
ploying the resulting hot combustion gases to heat the withdrawn gases before reintroducing the withdrawn gases into the heating and charring zone.

4,329,203

MULTIPLE STAGE COMBUSTION MEANS FOR HEATING SLOT TYPE COKE OVENS

Paul V. Faber, and Howard H. Shih, both of Morristown, N.J., assignors to Wilputte Corporation, Murray Hill, N.J.

Filed Aug. 29, 1980, Ser. No. 182,791
Int. Cl.³ C10B *5/02, 21/06, 21/12, 21/22*
U.S. Cl. 202—135 **3 Claims**



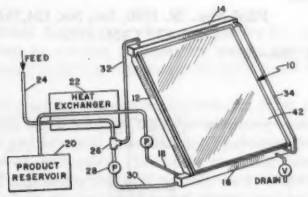
1. A heating system for tall horizontal type coke ovens having heating walls adjacent coke oven chambers within which walls are vertical flues for effecting combustion of fuel gases admitted thereto, wherein the improvement comprises two side-by-side vertical channels in a wall of each flue through which air and lean fuel gas are separately admitted into that flue from different sources at corresponding different levels for effecting mixture of air and fuel gas as they enter the flues and the combustion of the fuel gas at different levels in the flues above the floor of the coke oven chamber and including a source means for air connected to one channel and a source for lean gas connected to the other channel.

4,329,204

MULTIPLE EFFECT THIN FILM DISTILLATION SYSTEM

John P. Petrek, 235 Green Ave., Escondido, Calif. 92025, and Clifford M. Cantrell, 606 Coast Ave., Richland, Wash. 99352

Filed Feb. 19, 1980, Ser. No. 122,243
Int. Cl.³ B01D *1/26*
U.S. Cl. 202—174 **19 Claims**



1. A multiple effect diffusion distillation system comprising in combination:

a plurality of closely spaced parallel heat transfer plates spaced one half inch or less apart defining a vapor chamber having opposed evaporating and condensing faces,

said plates being disposed at an angle to the horizontal to enable gravity flow of a liquid along said faces from the upper end to the lower end,

means for feeding a thin film or liquid onto said evaporating face adjacent the upper end at a predetermined controlled rate,

means for maintaining said liquid in a thin film along said entire face,

means for establishing a heat flux across said heat transfer plates at a rate for effecting evaporation of at least a portion of said liquid passing along said face for establishing a stable continuous evaporation of liquid from said evaporating face and condensation of vapor onto said condensing face, and

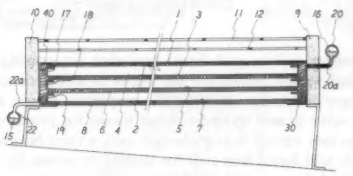
means for separately collecting said condensate at the lower edge of said plates.

4,329,205

PROCESS FOR DISTILLING WATER AND DISTILLATION APPARATUS

Kenji Tsumura, Nishinomiya, and Masayuki Yamashita, Osaka, both of Japan, assignors to Oriental Metal Mfg. Co., Ltd., Amagasaki, Japan

Filed Mar. 12, 1980, Ser. No. 129,740
Claims priority, application Japan, Mar. 22, 1979, 54-34051; Aug. 11, 1979, 54-102576
Int. Cl.³ B01D *1/22*
U.S. Cl. 202—174 **5 Claims**



1. An apparatus for distilling water which comprises:

(a) a casing,

(b) a heat receiving plate member for receiving heat on one side thereof and evaporating water to be treated on the other side thereof,

(c) a plurality of cooling plate members for condensing the water vapor and evaporating water to be treated by the latent heat of the condensation, said cooling plate members being arranged in parallel spaced relationship with said heat receiving plate member and with each other, each reflective cooling plate having a reflective mirror surface on the condensing side,

(d) water holding means for holding said water to be treated on the other side of said heat receiving plate member and on one side of each of said cooling plate members, said each water holding means being opposite to the condensing surface of the adjacent cooling plate member,

(e) a water supply means for supplying the water to be treated to said water holding means, and

(f) a water collecting means for collecting the condensed water.

4,329,206

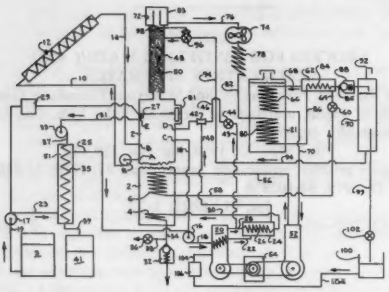
ALCOHOL DISTILLATION APPARATUS

William H. Cartland, Jupiter, Fla., assignor to Solar Development Inc., Riviera Beach, Fla.

Filed Apr. 7, 1980, Ser. No. 138,016
Int. Cl.³ B01D *3/02*
U.S. Cl. 202—177 **10 Claims**

1. A distillation apparatus having boiler means for boiling a liquid substance, heat producing means for providing heat for a liquid substance in said boiler means, an engine, said heat producing means including means for transferring heat from said engine to a liquid substance in said boiler means, a compressor means, said compressor means having an outlet and an inlet, transmission means between said engine and said compressor means for driving said compressor by said engine, container means containing a liquid heat sink for substantially reducing external cooling requirements, a first heat exchanger coil for heating said liquid substance in said boiler means, said

first heat exchanger coil having an inlet and outlet, first conduit means connecting said compressor means outlet to said inlet of said first heat exchanger, a second heat exchanger coil in said liquid heat sink, said second heat exchanger coil having an inlet and an outlet, second conduit means connecting said first heat exchanger outlet to the inlet of said second heat



exchanger coil in said liquid heat sink for cooling it, third conduit means connecting the outlet of said second heat exchanger coil to the inlet of said compressor means, an expansion valve in said second conduit means for providing a cold gas to said second heat exchanger coil, a third heat exchanger coil in said liquid heat sink for heating it, means for passing a hot fluid through said third heat exchanger coil.

4,329,207

NEUTRAL TIN ELECTROPLATING BATHS

Masatosi Maruta, Yokohama, Japan, assignor to Kizai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,446
Claims priority, application Japan, Feb. 21, 1980, 55-19737
Int. Cl.[3] C25D *3/32*
U.S. Cl. 204—54 L 4 Claims

1. A substantially neutral aqueous tin electroplating bath at a pH value of 6.0–9.5 consisting of a stannous salt, an alkali metal salt of pyrophosphoric acid, a polyhydric phenol and a surface-active agent.

4,329,208

METHOD AND APPARATUS FOR CONVERTING ETHYLENE TO ETHYLENE OXIDE

Costas G. Vayenas, Wellesley Hills, and Michael Stoukides, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 16, 1981, Ser. No. 225,542
Int. Cl.[3] H01M *8/10, 8/22;* C25B *3/02;* C07D *301/04*
U.S. Cl. 204—59 R 7 Claims

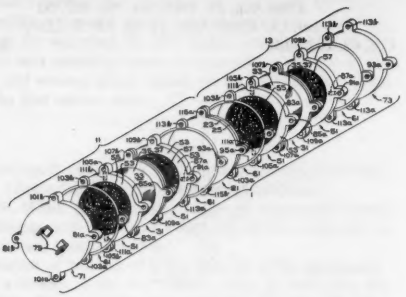
1. The process for oxidizing ethylene to form ethylene oxide which comprises passing an ethylene-containing feed gas in contact with a first catalyst deposited on a first surface of a solid electrolyte and passing an oxygen-containing gas in contact with a second catalyst deposited on a second surface of said solid electrolyte, said first catalyst being capable of promoting the oxidation of ethylene to ethylene oxide, said second catalyst being capable of dissociating oxygen gas to form oxygen ions to contact said ethylene to form ethylene oxide and applying a voltage between said first and second catalysts through said solid electrolyte.

4,329,209

PROCESS USING AN OXIDANT DEPOLARIZED SOLID POLYMER ELECTROLYTE CHLOR-ALKALI CELL

Harlan B. Johnson, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 14,469, Feb. 23, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 227,850
Int. Cl.[3] C25B *1/34*
U.S. Cl. 204—98 10 Claims



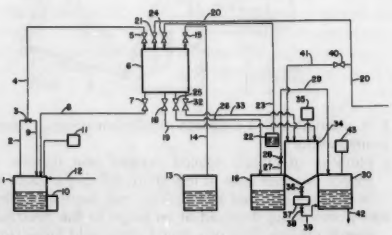
1. In a method of electrolysis comprising feeding an aqueous alkali metal chloride brine to an electrolytic cell having an anolyte compartment separated from a catholyte compartment by a solid polymer electrolyte, said solid polymer electrolyte having an anodic electrocatalyst facing the anolyte compartment and a cathodic electrocatalyst facing the catholyte compartment; imposing an electrical potential across the solid polymer electrolyte; and withdrawing chlorine from the anolyte compartment and alkali metal hydroxide from the catholyte compartment; the improvement comprising providing a cathode depolarization catalyst on the cathodic side of the solid polymer electrolyte, and feeding a peroxide to said catholyte compartment whereby to avoid hydrogen evolution at the cathodic surface of the solid polymer electrolyte.

4,329,210

METHOD OF REGENERATING ETCHANT AND RECOVERING ETCHED METAL

Vijay Merchant, Dayton; Stephen R. Henriksen, Kettering; R. Wayne Boucher, and Jerrold J. Dodd, both of Dayton, all of Ohio, assignors to Robert W. Becker, Kettering, Ohio, a part interest

Filed Mar. 28, 1980, Ser. No. 134,784
Int. Cl.[3] C25C *1/12*
U.S. Cl. 204—107 10 Claims



1. A method of regenerating an ammoniacal etchant, said method comprising the steps of:

withdrawing, from an etcher sump, etching solution containing copper ions at a concentration above an efficiency parameter;

conveying said etching solution to a cation exchange resin

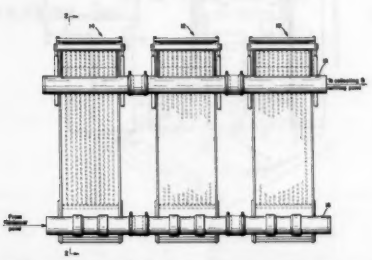
bed for selective removal and retention of said copper ions by said cation exchange resin bed;
returning regenerated effluent etchant from said cation exchange resin bed to said etcher sump at a copper ion concentration at said efficiency parameter;
rinsing said cation exchange resin bed with deionized water to remove residual etching solution therefrom;
conveying effluent deionized water and residual etching solution from said cation exchange resin bed to a metal recovery unit;
rinsing said cation exchange resin bed with an aqueous solution of an acid to remove said copper ions and to regenerate said cation exchange resin bed;
conveying effluent aqueous solution of acid and copper ions to said metal recovery unit;
rinsing said cation exchange resin bed with deionized water to remove residual acid therefrom;
conveying effluent deionized water and residual acid to said metal recovery unit;
passing a selectolyte solution through said cation exchange resin bed to enhance the cation retention property thereof and to provide a pH balance during said step of conveying said etching solution to said cation exchange resin bed; and
conveying spent effluent selectolyte solution to a storage container.

4,329,211

SIMPLIFIED MAINTENANCE ELECTROCOAGULATOR

William J. Plantes; Robert P. Goldstein, both of Pittsburgh, and Jerome K. Wolfe, Export, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1981, Ser. No. 244,712
Int. Cl.³ C02C *5/12*
U.S. Cl. 204—149 **20 Claims**



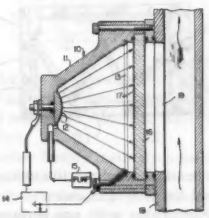
1. A simplified maintenance electrocoagulator for purifying water or fluids by causing precipitation and/or oxidation of solids or metals to a dewatering sludge for subsequent removal comprising:
at least one modular housing having bottom, front, rear and side walls and having an inlet for admitting water to be purified and an outlet for water and agglomerated solids;
a plurality of upstanding, removable electrode assemblies, slidably disposed within said module, each assembly comprising a pair of upstanding metal electrode plates having opposed, closely spaced faces defining a flow path therebetween, insulating frame means interconnecting upstanding edges of said plates and extending laterally across the top and bottom portions thereof, said lateral extensions interconnecting adjacent portions of said electrodes plates and defining a plurality of openings therethrough, the openings being coincident with the flow path defined by the adjacent electrode faces, and means mounted on the upper portion of each electrode for coupling said electrode to a source of alternating current;
insulating means disposed between adjacent electrode assemblies within said housing for isolating each of said assemblies;
means carried by said electrocoagulator for directing a flow of water to be purified sequentially through the inlet into said housing, through the lower lateral frame extension of each electrode assembly, through the flow path between electrode faces, through the upper lateral frame extension of each assembly, and subsequently through the outlet of said housing;
means carried by said electrocoagulator for agitating the water to be purified in the flow path to maintain the water in turbulence while it passes between electrode faces;
conductive and abrasive means disposed in the flow path in each assembly for enhancing the alternating current field across said electrodes and for scrubbing the electrode faces when water to be purified is directed through the flow paths between said electrodes.

4,329,212

METHOD FOR MAKING OZONE

David N. Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,782
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—157.1 R **2 Claims**



1. A method of producing ozone from oxygen or an oxygen bearing gas comprising, exposing a UV emitting phosphor compound which emits radiation only in the range of from about 130 to 170 nanometers to electrical energy, generating ultraviolet radiation in the wave length range of from about 130 to 170 nanometers, with substantially none below 130 nm or above 200 nm, and exposing the oxygen or oxygen bearing gas to the ultraviolet radiation whereby a portion of the oxygen molecules are converted to single oxygen atoms which combine with other oxygen molecules to produce ozone.

4,329,213

GEL DIFFUSION IMMUNOASSAY INCLUDING α-FETO PROTEIN DETERMINATION

Hans B. Elwing, Chalmersgatan 5, 411 35 Gothenburg, Sweden

PCT No. PCT/SE78/00019, § 371 Date Mar. 14, 1979, § 102(e) Date Mar. 14, 1979, PCT Pub. No. WO79/00044, PCT Pub. Date Feb. 8, 1979
PCT Filed Jul. 13, 1978, Ser. No. 23,193
Claims priority, application Sweden, Jul. 14, 1977, 7708179
Int. Cl.³ G01N *33/54;* B01D *57/02;* G01N *27/26*
U.S. Cl. 204—180 G **8 Claims**

1. A method of determining the quantity and type of biologic substances of the kind in which a component selected from the group consisting of proteins, polysaccharides, nucleic acids, lipids, and complexes thereof biospecifically reacts and where the result of the reaction is visualized in situ with the aid of a component bound to the surface of a solid, comprising
a. providing a system containing (1) a first biologically active component bound to a solid surface and (2) a liquid-saturated immobilized phase located at said solid surface and containing a second biologically active component,
b. adding to said system a test aliquot containing a third biologically active component to be determined, said third biologically active component capable of reacting with

said second biologically active component in said immobilized phase to form a precipitate containing equivalent concentrations of said second biologically active component and said third biologically active component,

c. permitting said third biologically active component to diffuse or migrate electrophoretically and form a precipitate with said second biologically active component in said immobilized phase,

d. reacting said precipitate with said first biologically active component,

e. removing said immobilized phase, and

f. detecting the presence or quantity of said third biologically active component on said solid surface.

4,329,214

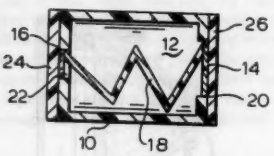
GAS DETECTION UNIT

Lawrence Spritzer, Peekskill, N.Y.; Joseph R. Stetter, Naperville, Ill., and Donald R. Rutt, Merrick, N.Y., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Jul. 21, 1980, Ser. No. 170,368

Int. Cl.³ G01N *27/28, 27/46*

U.S. Cl. 204—195 R **6 Claims**



1. An electrochemical gas detection unit, comprising

(a) a cylindrical electrolyte chamber;

(b) a working electrode with one surface exposed to said electrolyte chamber;

(c) a counterelectrode with one surface exposed to said electrolyte chamber;

(d) a reference electrode with one surface exposed to said electrolyte chamber;

(e) said working, said counter and said reference electrodes are positioned in a single plane at one end of said chamber;

(f) means interconnecting said working electrode and said reference electrode for maintaining a pre-selected fixed reference potential on said working electrode;

(g) intake means for exposing said working electrode to a gas to be detected;

(h) wick means positioned entirely within said chamber;

(i) said wick means is in the shape of a cylinder extending along the length of said chamber and closed at one end for contacting electrolyte in said chamber;

(j) said closed end of said wick means positioned entirely within said single plane for interconnecting said working electrode, said counterelectrode and said reference electrode; and

(k) said wick means being comprised of a material which is wettable by an electrolyte introduced into said chamber.

4,329,215

SODIUM HYPOCHORITE PRODUCTION AND STORAGE SYSTEM

Frank Scoville, 4646 S. 3075 E., Salt Lake City, Utah 84117

Filed Jun. 13, 1980, Ser. No. 159,055

Int. Cl.³ C25B *15/08, 9/00*

U.S. Cl. 204—229 **7 Claims**

1. A system for the on-site preparation and storage of a sanitizing alkali metal hypochlorite solution comprising:

(a) a source of deionized or soft water,

(b) a brine container for holding a saturated brine solution of an alkali metal chloride,

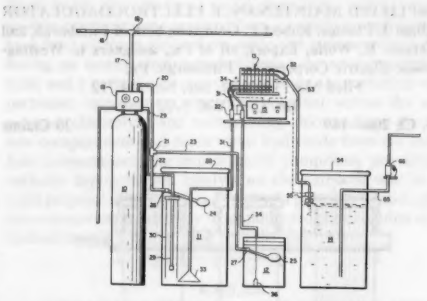
(c) a water container for holding deionized or soft water,

(d) means to provide and control the flow of soft water from said source to said brine and water containers,

(e) an electrolytic chlorine generation unit consisting of one or more cells wherein each cell houses an anode and cathode and is divided into separate anode and cathode compartments separated by a membrane impermeable to chloride ions, each anode compartment having an inlet passageway for receiving a saturated alkali metal chloride brine solution and an outlet passageway for releasing chloride and spent brine, each cathode compartment having an inlet passageway for receiving deionized or soft water and an outlet passageway for releasing hydrogen gas and an alkali metal hydroxide solution.

(f) means for supplying saturated brine solutions from said brine container to said anode compartments and means for supplying deionized or soft water from said water container to said cathode compartments of said cells.

(g) means for collecting chlorine and spent brine from the anode compartments of said cells, means for collecting hydrogen and alkali metal hydroxide from the cathode compartments of said cells and receiving means wherein collected chlorine, spent brine, hydrogen and alkali metal



hydroxide are intermixed and an alkali metal hypochlorite is formed,

(h) control means for receiving an AC current and converting it to DC current and applying a DC voltage across the cell or cells of said chlorine generation unit to allow DC current to flow through said unit to produce chloride at the anode and hydrogen gas at the cathode of each of said cells,

(i) hypochlorite storage means separately located from said generation unit adapted to receive alkali metal hypochlorite solution from said receiving means said hypochlorite storage means containing a float switch electrically connected to the control means which float switch operates to prevent the flow of electricity to the control means when the alkali metal hypochlorite content in said storage means reaches a predetermined level, and

(j) at least one thermal switch attached to the electrolytic chlorine generation unit, which switch is sensitive to the temperature within said unit and through which the DC current flowing through said unit must pass such that when a predetermined temperature within said unit is reached, said thermal switch will open interrupting the flow of current through said unit.

4,329,216

ELECTROLYTIC CELL UTILIZING A TRANSITION METAL-GRAPHITE INTERCALATION COMPOUND CATHODE

Donald W. DuBois, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 165,995, Jul. 7, 1980, Pat. No. 4,282,074. This application Apr. 3, 1981, Ser. No. 250,821

Int. Cl.³ C25B *9/00, 11/12, 13/08*

U.S. Cl. 204—252 **14 Claims**

1. In an electrolytic cell having an anode, a cathode, and an ion permeable separator therebetween, the improvement wherein the cathode comprises an intercalation compound comprising graphite and a transition metal component.

4,329,217

CLADDING CATHODE OF ELECTROLYTIC CELL WITH DIAPHRAGM OR MEMBRANE

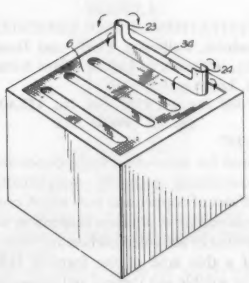
Geoffrey C. M. Byrd, Frodsham, and Colin Stanier, Northwich, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 7, 1980, Ser. No. 166,744

Claims priority, application United Kingdom, Jul. 20, 1979, 7925382

Int. Cl.³ C25B *9/00, 13/02*

U.S. Cl. 204—252 **14 Claims**



1. A diaphragm, suitable for cladding a cathode box comprising a plurality of foraminate cathodes of the pocket type, the diaphragm comprising:

a sleeve portion having a pair of open ends defined by edges;

a plurality of tabs on both edges of the sleeve portion;

the sleeve portion having an exterior circumference substantially the same as interior circumference of a pocket of the cathode box;

the material comprising the edges and tabs of said diaphragm being flexible; and

the sleeve portion having a length such that when the diaphragm is positioned in a pocket of the cathode box, the edges of the sleeve portion and the tabs thereon project beyond the extremities of the pocket and the tabs may fold towards the upper and lower surfaces of the cathode box to a position in which they are adjacent and joinable to the projecting part and tabs of a sleeve diaphragm in an adjacent pocket which have been similarly folded.

4,329,218

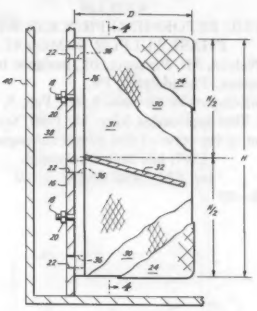
VERTICAL CATHODE POCKET ASSEMBLY FOR MEMBRANE-TYPE ELECTROLYTIC CELL

Marius W. Sorenson; Bobby R. Ezzell, both of Lake Jackson, and John R. Pimlott, Sweeny, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 68,133, Aug. 20, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 210,941

Int. Cl.³ C25B *11/03, 11/00, 9/00*

U.S. Cl. 204—283 **12 Claims**



1. A cathode for use in an electrolytic cell comprising

(1) a pair of foraminous plate-like members joined in parallel spaced-apart relationship on three sides to provide a pocket-like member;

(2) an end-member fixably matingly joinable with the open end of said pocket-like member;

(3) baffle members extending from said end-member into said pocket traversing from side to side and into from about 60 to about 98 percent of the distance opposite said end-member;

(4) portholes in and through said end-member, one at the upper end of said end-member and one at the lower end of said end-member and one below the point of attachment of each baffle from said end-member, said portholes providing fluid passage for from 5 to about 50 percent of the area of said end-member;

(5) means associated with said end-member to secure said end-member when integral with said pocket in electrical contact and fluid tight abutment to a catholyte backplate of said electrolytic cell; and

(6) a non-porous ion-exchange membrane enclosing said foraminous plate-like members.

4,329,219

ELECTRODE FOR ELECTROCHEMICAL PROCESSES

Ernest A. Druzhinin, ulitsa Gvardeiskaya, 4, kv. 32; Vladimir L. Kubasov, ulitsa Kirovogradskaya, 4, korpus 2, kv. 135; Vladimir B. Busse-Machukas, Izmailovsky bulvar, 37, kv. 27; Florenty I. Lvovich, 1 Nizhne-Mikhailovsky proezd, 16, kv. 55; Evgeny L. Krongauz, Bolshaya Andronievskaya ulitsa, 20, kv. 487, and Leonid I. Jurkov, ulitsa Tashkentskaya, 22, korpus 1, kv. 124, all of Moscow, U.S.S.R.

Filed Oct. 29, 1979, Ser. No. 89,042

Int. Cl.³ C25B *11/08, 11/10;* **B05D** *1/00, 3/02*

U.S. Cl. 204—290 F **5 Claims**

1. An electrode for electrochemical processes, said electrode consisting essentially of a current-conducting base of a passivating metal having a layer of an active mass deposited thereon, said layer consisting of silica, oxides of passivating metals and oxides of metals of the platinum group, the components being present in the following proportions, in percent by mass:

silica	10-90

-continued

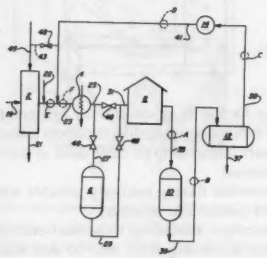
platinum group metal oxides	5–45
oxides of passivating metals	5–45.

4,329,220

CATALYTIC REFORMING PROCESS WITH LIQUID PHASE SULFUR REMOVAL

Thomas J. Nelson, Mt. Prospect, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 9,001, Feb. 5, 1979, Pat. No. 4,225,417. This application Mar. 14, 1980, Ser. No. 130,314
The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.
Int. Cl.[3] C10G *25/00, 23/02*
U.S. Cl. 208—89 12 Claims



1. A reforming process for a hydrocarbon material containing a sulfur component comprising: contacting in a liquid phase sulfur removal zone at liquid phase sulfur removal conditions, said hydrocarbon material with a manganese-containing composition which comprises a manganese component capable of removing at least a portion of said sulfur component at said sulfur removal conditions to produce a reduced sulfur-containing hydrocarbon feedstock, and contacting in a reforming zone in the presence of hydrogen at hydrocarbon reforming conditions said feedstock with a catalyst comprising a catalytically effective amount of a platinum-group metal component capable of reforming said feedstock at such reforming conditions to produce a reformed product.

4,329,221

UPGRADING OF HYDROCARBON FEEDSTOCK

Malvina Farcasiu, Princeton; Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 12, 1980, Ser. No. 186,926
Int. Cl.[3] C10G *45/04, 45/30*
U.S. Cl. 208—214 17 Claims

1. A process for reducing the metal, sulfur and nitrogen content of hydrocarbon feedstock which comprises contacting a mixture of hydrocarbon feedstock and hydrogen donor solvent in the absence of added hydrogen and under liquid phase reaction conditions with a catalyst composition comprising a naturally occurring porous metal ore selected from the group consisting of manganese nodules, bog iron, bog manganese, nickel laterites and bauxite.

4,329,222

METHOD FOR SELECTIVELY REMOVING BASIC NITROGEN COMPOUNDS FROM LUBE OILS USING TRANSITION METAL HALIDES OR TRANSITION METAL TETRAFLUOROBORATES

Jacob J. Habeeb, Sarnia, Canada, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 26, 1980, Ser. No. 191,078
Int. Cl.[3] C10G *17/00, 25/02, 29/12;* C07C *7/12*
U.S. Cl. 208—254 R 21 Claims

1. A method for selectively removing basic nitrogen compounds (BNC) from natural and synthetic hydrocarbon feedstocks comprising mixing the feedstock under conditions of agitation and mild heating with anhydrous nonpolymeric Group IVB, Group VB, Group VIB, Group VIIB, the nonnoble Group VIII, copper, zinc, cadmium and mercury halides, except that the halide may not be chlorine, which metal halides are complexed with nonaqueous polar solvent and wherein the metal halide-nonaqueous polar solvent complex is impregnated onto a support material, whereby the BNC exchange with the complexed nonaqueous polar solvents and themselves become complexed with the metal halides of the supported metal halide-nonaqueous polar solvent complex.

13. A method for selectively removing basic nitrogen compounds (BNC) from natural and synthetic hydrocarbon feedstocks comprising mixing the feedstock under conditions of agitation and mild heating with anhydrous nonpolymeric Group IVb, Group Vb, Group VIb, Group VIIb, the nonnoble Group VIII, copper, zinc, cadmium and mercury tetrafluoroborates which metal tetrafluoroborates are complexed with nonaqueous polar solvents whereby the BNC exchange with the complexed nonaqueous polar solvents and themselves become complexed with the metal tetrafluoroborates.

4,329,223

FLOTATION OF MOLYBDENITE

Gopalan Ramadorai, Fullerton, Calif., and Douglas R. Shaw, Tucson, Ariz., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Jan. 11, 1980, Ser. No. 111,434
Int. Cl.[3] B03D *1/06*
U.S. Cl. 209—167 8 Claims

1. The method for recovering molybdenite from a flotation concentrate containing primarily molybdenite and minor amounts of sulfides of copper and iron which comprises conditioning said concentrate in aqueous suspension with first about 0.001 to 0.01 pound of activated carbon and then about 0.001 to 0.01 pound of a thio acid of the formula HS-R-COOH or HS-R-COSH or soluble salt thereof and subjecting the suspension of conditioned concentrate to froth flotation at ambient temperature for the recovery of said molybdenite, wherein R represents an aliphatic hydrocarbon group having 1 to about 5 carbon atoms or the group CO, the weight ratio of said carbon and said thio acid is about 1:1 and said pounds of said carbon and said thio acid are per pound of copper in said concentrate.

4,329,224

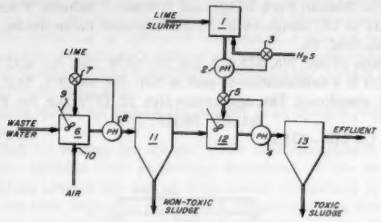
WASTEWATER TREATMENT PROCESS

Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 14, 1980, Ser. No. 206,798
Int. Cl.[3] C02F *1/62*
U.S. Cl. 210—709 12 Claims

1. A process for precipitating heavy metal pollutant ions from an aqueous solution to be treated, comprising the steps of:

(a) forming an aqueous CaS mixture comprising $Ca(OH)_2$ and $Ca(HS)_2$ in solution; and



(b) adding enough of the CaS mixture to said aqueous solution to be treated to precipitate heavy metal pollutant ions therefrom.

4,329,225

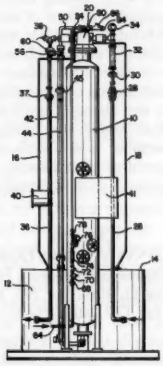
MIXED BED DEIONIZER

Stephen H. Davis, Dayton, and Daniel W. Simpson, Fairfield, both of Ohio, assignors to Water Refining Company, Inc., Middletown, Ohio

Filed Dec. 29, 1980, Ser. No. 220,325

Int. Cl.³ B01J *49/00*

U.S. Cl. 210—96.1 **8 Claims**



1. A mixed bed deionizer device, comprising:

a tank for containing anion and cation resins therein for deionizing water;

a caustic solution supply means for supplying caustic solution to the tank;

an acid solution supply means for supplying acid solution to the tank;

a raw water supply pipe for supplying water to be deionized to the tank;

a deionized water outlet pipe for carrying away water which has been deionized in the tank;

a drain pipe for carrying away the solutions passed through the tank during regeneration of the resins;

a pressurized air supply pipe for supplying air to the tank for mixing the resins after regeneration;

a vented air drain pipe for carrying away air passed through the tank for mixing the resins;

a pair of multi-function valve means one each associated with the acid and caustic solution supply means for controlling flow of the solutions into and out of the tank; and

at least one manifold means supporting the pair of multi-function valve means and having a plurality of passageways interconnecting the pair of multi-function valve means with the raw water supply pipe, the deionized water outlet pipe, the drain pipe and the tank for routing of ingress and egress of the solutions, the raw water and the deionized water to and from the tank in a predetermined sequence.

4,329,226

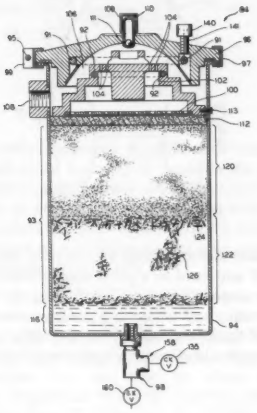
OIL RECONDITIONING SYSTEM

Bruce L. Thompson, Highland, Mich., assignor to Amber Oil Process, Inc., Highland, Mich.

Continuation-in-part of Ser. No. 927,350, Jul. 24, 1978, abandoned. This application Jun. 13, 1979, Ser. No. 48,230

Int. Cl.³ B01D *35/18*

U.S. Cl. 210—180 **13 Claims**



1. A filter system for cleaning and reconditioning used industrial oil, the system comprising:

means for continuously pumping said oil into said system,

means for preheating incoming oil to a selected temperature,

axial-flow filter means including at least one layer initially comprising a loosely packed blend of flexible fiber material and of rigid excelsior-like fiber material,

said fibers being compressed in a dry state upon initiation of flow of said oil, and

said flexible fibers being approximately 60% to 50% of the total volume of said layer, whereby

said filter means receives and passes all of said oil to mechanically clean same and to break and absorb water emulsions and droplets therefrom,

a heating chamber means for receiving said oil and vaporizing volatile contaminants from same, and

means for conveying cleaned and reconditioned oil away from said filter system.

4,329,227

DEVICE FOR THE GASIFICATION OF LIQUIDS

John J. Todd, 11 Overbrook, West Horsley, Surrey, England

Filed Feb. 27, 1980, Ser. No. 125,132

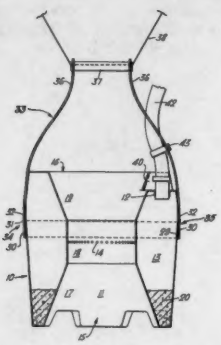
Claims priority, application United Kingdom, Dec. 13, 1979, 7943005

Int. Cl.³ B01F *3/04;* **C02F** *1/74*

U.S. Cl. 210—220 **8 Claims**

1. In apparatus for the treatment of liquids by gasification, a gasification device and flexible suspending means for freely suspending said device in a body of liquid to be gasified; said device comprising a hollow annular member bounding a central liquid flow passageway, said member having a gas inlet into said hollow and a plurality of apertures surrounding said passageway to permit introduction of gas from said hollow into liquid flowing in use up through said passageway to form

gas bubbles in said liquid, weighting matter associated with said member to give said device an overall density greater than that of said liquid, and suspension means generally rigid with said member and defining an effective suspension point located above said hollow annular member; said annular member having an external waist, and said suspension means comprising a band encircling said external waist and a handle generally rigid



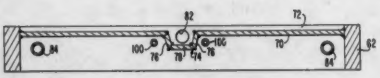
with said band and extending up and over the member from one point of said band to a point diametrically opposite; and said flexible suspending means constituting the sole means for freely suspending said device at a predetermined depth within said body of liquid and comprising a flexible suspending line passing through said effective suspension point of said gasification device.

4,329,228

FILTER PLATE FOR HORIZONTAL PLATE FILTER

William D. Crowe, San Francisco, and Darrell E. Snell, Tiburon, both of Calif., assignors to J. R. Schneider Co., Inc., Corte Madera, Calif.

Filed Feb. 23, 1981, Ser. No. 237,209
Int. Cl.³ B01D *25/12*
U.S. Cl. 210—230 **10 Claims**



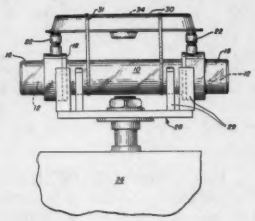
1. In a horizontal plate filter: a filter plate having a generally upright, polygonal side wall and a divider plate secured to the side wall below the upper margin thereof, said filter plate adapted to be mounted in an operative position below a filter medium with the filter medium engaging the upper margin of the side wall and with the divider plate spaced below the filter medium; means removably mounted on the filter plate for directing a fluid to be filtered into the space within the side wall and below the divider plate; means removably coupled with said side wall for venting said space; and means on the divider plate for forming an open top trough therein, said trough adapted for receiving filtrate from the filter medium thereabove when said filter plate is in said operative position, said side wall having an opening for allowing the filtrate in the trough to flow away from the filter plate.

4,329,229

METHOD OF POTTING THE ENDS OF A BUNDLE OF HOLLOW FIBERS POSITIONED IN A CASING

Bert S. Bodnar, Park Ridge, and William J. Schnell, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 928,477, Jul. 27, 1978, Pat. No. 4,227,295, which is a continuation-in-part of Ser. No. 888,071, Mar. 20, 1978, abandoned. This application Oct. 29, 1979, Ser. No. 89,016
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.2 **6 Claims**



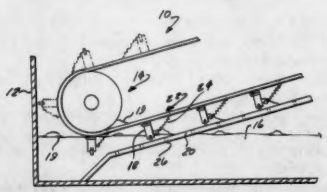
1. An elongated tubular casing containing a bundle of hollow fibers, said casing including casing closure member means at both ends thereof, and a pair of side apertures positioned in said casing, each closure member means comprising a cup-shaped member connected in sealing relation at its rim to the ends of said tubular casing, a portion of said cup-shaped member adjacent said rim being of relatively enlarged inner diameter, relative to said tubular casing, each said cup-shaped member also defining an extended cylindrical portion, positioned remotely from said rim, having an inner diameter less than said relatively enlarged inner diameter portion and receiving an end of said hollow fiber bundle, said tubular casing carrying a hollow, elongated member which defines outlet ports connected to the side apertures of said casing, said hollow, elongated member containing a curable liquid sealant.

4,329,230

CONVEYOR SYSTEM

Michael J. Quin, 27230 Shehan, Dearborn Heights, Mich. 48127

Filed May 12, 1980, Ser. No. 149,006
Int. Cl.³ B01D *23/02*
U.S. Cl. 210—413 **4 Claims**



1. An apparatus for separating cake from a liquid comprising:

a reservoir for holding the cake containing liquid;

a continuous conveyor supported within the reservoir inclined upward from a surface of the cake containing liquid;

at least one outward extending scraper movable with the conveyor;

an inclined wall supported within the reservoir engageable with the scraper positioned below and parallel to said conveyor including a plurality of drain apertures to allow liquid to drain through under gravity;

means for pivotally mounting the scraper to the conveyor and permitting said scraper to pivot upon encountering an

obstruction not capable of being conveyed comprising a conveyor engaging member transversely hinged thereto and abutting the conveyor, a hinge means joining the conveyor engaging member and the conveyor and allowing the conveyor engaging member to pivot counter to the direction of conveyor movement, a pair of spaced parallel upright walls integral with the conveyor engaging member, a scraper blade carried between the upright walls to pivot therewith;

biasing means for biasing the scraper in an upright position; and

means for biasing the scraper blade into engagement with the inclined wall permitting movement of the scraper blade toward the wall as wear occurs comprising at least one bore formed in the scraper, a biasing spring slidingly engaging the bore and biasing the blade toward the inclined wall.

4,329,231

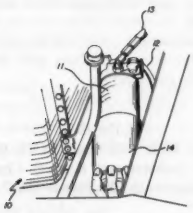
INSULATING FUEL FILTER COVER

Edward L. Hoffman, and David L. Mitton, both of Forest Lake, Minn., assignors to Mitthoff Corporation, Forest Lake, Minn.

Filed Oct. 1, 1979, Ser. No. 80,341

Int. Cl.³ B01D *23/00, 25/00, 27/00, 29/00*

U.S. Cl. 210—416.4 **5 Claims**



1. The combination of a diesel internal combustion engine having a diesel fuel filter and a thermally insulating unitary, fuel filter cover, said cover comprising:

a cylindrical body of flexible thermal insulating expanded foam material with a fire retardant characteristic having a closed end, an open end, and a hollow interior portion frictionally engaging and covering side surfaces and covering a bottom of the fuel filter and having sufficient structural strength to frictionally remain in place on the fuel filter without further fastening means to provide thermal insulation between the fuel filter and a surrounding enenvironment, said body of expanded foam material having a self-skinned molded exterior.

4,329,232

METHOD FOR MEASURING BIOMASS VIABILITY

Eva J. McKenna, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 9, 1980, Ser. No. 214,585

Int. Cl.³ C02F *3/02*

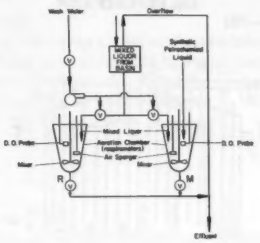
U.S. Cl. 210—614 **5 Claims**

1. A method for semi-continuously evaluating the viability of a biomass of a waste treatment basin, said biomass contained in a waste basin mixed liquor, comprising the steps of:

(a) measuring the rate of oxygen uptake, R, in a first sample of said waste basin mixed liquor, said first sample having a predetermined volume and a predetermined dissolved oxygen content;

(b) separately measuring the rate of oxygen uptake, M, in a mixture of a second sample of said waste basin mixed liquor and a sample of synthetic petrochemical reference liquid selected to contain organic compounds representative of those normally present in the influent stream passed to the waste basin, said second sample having substantially the same volume and dissolved oxygen content as said first sample, said mixture constituting predominantly said second sample of said waste basin mixed liquor and a relatively small amount of said synthetic petrochemical reference liquid;

(c) subtracting to determine the differential of said rates, M



minus R, which represents the differential oxygen uptake rate of said waste basin mixed liquor in the presence of said synthetic petrochemical reference liquid; and

(d) effecting, by predetermined correlation with differential oxygen uptake rate, a determination of the viability of said biomass based on said differential oxygen uptake rate for said waste basin mixed liquor.

4,329,233

PROCESS FOR THE PURIFICATION OF WATER

Andreas B. van Aken, Amsterdam, Netherlands; George C. Blytas, Houston, Tex., and Rene M. Visser, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 25, 1980, Ser. No. 210,205

Claims priority, application Netherlands, Nov. 27, 1979, 7908586

Int. Cl.³ C02F *1/28*

U.S. Cl. 210—673 **8 Claims**

1. A process for the purification of water, containing at least one organic compound comprising carbon, hydrogen and at least one atom selected from oxygen and nitrogen, said organic compound having a solubility in water at 20° C. of more than 1 g/100 ml, which process comprises contacting said water as feed in a contact zone with a crystalline iron silicate having the following properties:

(a) thermally stable up to a temperature above 600° C.,

(b) an X-ray powder diffraction pattern showing, inter alia, the reflections given in Table A of the specification,

(c) in the dehydrated form the following overall composition, expressed in moles of the oxides:

$$(1.0\pm0.3)(R)_{2/n}O.[a\ Fe_2O_3.b\ Al_2O_3.c\ Ga_2O_3].y\ (d\ SiO_2.e\ (GeO_2),$$

where

R=one or more monovalent or bivalent cations,

$a>0.1$;

$b>0$,

$c>0$,

$a+b+c=1$;

$y>10$,

$d>0.1$,

$e>0$,

$d+e=1$; and

n=the valency of R;

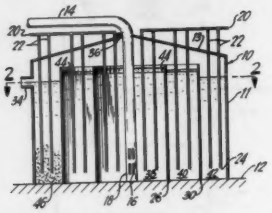
and in which oxides of hydrogen, alkali metal and/or alkaline-earth metal, silicon and iron are present, and the Fe_2O_3/SiO_2 molar ratio is less than 0.1; and

separating a water product having lower content of said at least one organic compound than said feed water.

4,329,234
MULTI-STAGE GAS LIQUID REACTOR

John J. Cikut, Chester; Irving D. Crane, Jr., Randolph, and Theodore Princiotto, Jr., Mountain Lakes, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 15, 1980, Ser. No. 140,570
Int. Cl.³ C02F *1/74*
U.S. Cl. 210—752 **6 Claims**



1. The method of sequentially reacting a liquid reactant and a gaseous reactant in a concentrically baffled, multi-stage reactor with a central liquid inlet and an array of gas inlets, comprising the steps of:

(a) supplying liquid reactant through the liquid inlet to the center of said reactor so as to create a positive liquid pressure exerted radially outward against said baffles,

(b) supplying gaseous reactants through the gas inlets to the lower regions of the various stages of the reactor so as to intermix and react with the liquid reactant and in such proportion as to decrease the density of the reaction mixture in each successive stage from the density of the reaction mixture in the preceding stage from the center of the reactor to its outer wall,

(c) passing the liquid reactant through a circuitous flow path by means of diametrically opposed baffle passages, each passage being of increasingly larger cross-sectional area than the area of the passage from the preceding stage,

(d) removing the reacted liquid product through an overflow discharge outlet, and

(e) exhausting the gaseous reactant collected at the top of the reactor.

4,329,235
APPARATUS AND METHOD FOR DISPENSING PURIFYING MEDIA MIXTURE

John G. Koltse, 2939 N. Oakley Ave., Chicago, Ill. 60618

Continuation-in-part of Ser. No. 915,815, Jun. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 785,832, Apr. 8, 1977, Pat. No. 4,133,757. This application Feb. 1, 1980, Ser. No. 117,465
Int. Cl.³ B01D *37/02*
U.S. Cl. 210—777 **20 Claims**

1. Apparatus for delivering additional filter material from a holding tank to an automatic filtration device, said device of the type having a filter chamber, a circulating pump to deliver process liquid to said filter chamber, and a continuous filter media indexable to position a fresh segment of said filter media within said filter chamber, said apparatus comprising:

a canister of known, selected volume;

means to control the intermittent filling of said canister with said additional filter material from said holding tank, and the draining thereof,

said control means including an ingress to said canister,

an egress from said canister,

a solenoid-actuated fill valve positioned along, and controlling, said ingress,

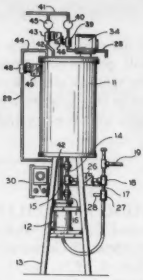
a solenoid-actuated empty valve positioned along, and controlling, said egress,

said full valve and said empty valve operating in tandem,

said fill valve opening and said empty valve closing to fill said canister,

said fill valve closing to suspend flow of said additional filter material from said holding tank to said canister, and said empty valve opening to drain said canister,

said control means further including means to fill and drain said canister a selectable number of times by opening and



closing said fill valve and said empty valve responsive to the intermittent operation of said automatic filter; and

means to deliver said additional filter material from said canister to said automatic filter,

said fill valve, said canister, said empty valve, and said delivery means defining a single flow path from said holding tank to said filtration device.

4,329,236
TECHNIQUE FOR TERTIARY OIL RECOVERY

Harvey E. Alford, Amherst, and Keng S. Chan, South Euclid, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 2, 1980, Ser. No. 136,641
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **5 Claims**

1. In a process for the tertiary recovery of oil wherein (a) brine, (b) an emulsifier system comprising an alcohol having no more than 12 carbon atoms and a surfactant comprising a neutralized, air-oxidized solvent extracted oil, the air oxidation reaction occurring at a temperature between about 250° F. to 350° F. wherein the solvent extracted oil has a viscosity between 50 SUS at 150° F. and 250 SUS at 210° F. before oxidation and wherein the oxidized solvent extracted oil has an acid number in the range of 10 to 40 before neutralization, and (c), a polymer, are injected into an injection well and oil recovered from a producing well, the improvement comprising:

(1) measuring the salt concentration of said brine, and

(2) adjusting the optimal salinity of said emulsifier system to approximate said salt concentration by:

(i) oxidizing said solvent extracted oil to a predetermined acid number within said range,

or

(ii) neutralizing said oxidized solvent extracted oil with a predetermined amount of base, or

(iii) both (i) and (ii).

4,329,237
DETERGENT SOFTENER COMPOSITIONS

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 96,370, Nov. 21, 1979, which is a continuation-in-part of Ser. No. 968,532, Dec. 11, 1978, Pat. No. 4,230,590. This application Oct. 27, 1980, Ser. No. 201,168
Int. Cl.³ C11D *1/86, 10/04, 17/06;* D06M *13/48*
U.S. Cl. 252—8.75 **33 Claims**

1. A detergent softener composition capable of imparting improved softness, detergency, antistatic and soil antiredeposi-

tion properties to fabrics treated therewith in the wash cycle of a laundering process comprising a particulate detergent base containing from about 5 to 40% by weight relative to the composition, of a water soluble non-soap, organic surfactant, at least about 90% thereof being of the anionic type, and from about 10 to 60% by weight relative to the composition, of water soluble, neutral to alkaline builder salt; said detergent base being (I) in admixture with discrete particles of cationic amine softener, said softener being selected from the group consisting of (a) aliphatic di-(lower) C_1–C_4 alkyl, di(higher) C_{14}–C_{24} alkyl quaternary ammonium salts (b) heterocyclic compounds, and mixtures of (a) and (b), and (II) in admixture with discrete particles of a mixture of water soluble or dispersible fatty acid soap and nonionic organic surfactant, said nonionic constituting from about 2 to about 50% by weight of the mixture, the weight ratio of soap to softener being from about 8:1 to 1:3, the percent concentration of anionic surfactant being at least about $1.5\times+5$, wherein x represents the percent concentration of softener, said softener particles comprising from about 2 to 20% by weight of the composition and being free of the soap-nonionic mixture, said soap-nonionic mixture particles comprising from about 2 to 20% be weight of the composition and being free of the cationic softener, and said detergent base being free of cationic softener.

30. A detergent softener composition, which comprises:

a dry-blended mixture of

about 2 to 20 weight percent discrete cationic softener particles,

about 2 to 20 weight percent discrete particles of a fatty acid soap and nonionic surfactant mixture,

about 5 to 40 weight percent water soluble non-soap, organic surfactant, at least about 90% thereof being of the anionic type,

from about 10 to 60 weight percent of a water soluble, neutral to alkaline builder salt;

said surfactant and said builder salt being combined together as a particulate detergent base before being mixed with the said softener and soap-nonionic particles,

said softener particles being free of the soap-nonionic mixture,

said soap-nonionic mixture particles and said detergent base being free of cationic softener,

said softener being selected from the group consisting of distearyl dimethyl ammonium chloride, di-hydrogenated tallow dimethyl ammonium chloride, di-tallow dimethyl ammonium chloride, distearyl dimethyl ammonium methyl sulfate, di-hydrogenated tallow dimethyl ammonium methyl sulfate, methyl-1-tallow amido ethyl-2-tallow imidazolinium methyl sulfate and methyl-1-oleyl amido ethyl-2-oleyl imidazolinium methyl sulfate,

said fatty acid soap being a mixture of C_{10} to C_{30} fatty acid alkali metal salts containing at least 50 weight percent C_{10} to C_{18} fatty acid salt,

said nonionic surfactant being selected from the group consisting of the condensation products of C_2 or C_3 alkylene oxide with C_6 to C_{12} alkyl phenols, the condensation products of C_2 or C_3 alkylene oxide with C_8 to C_{22} aliphatic alcohols and block condensation products of ethylene oxide and propylene oxide,

the weight percent of the nonionic surfactant in the fatty acid soap and nonionic surfactant mixture being from about 2 to about 50%,

the weight ratio of soap to softener being from about 8:1 to 1:3, and

the percent concentration of non-soap anionic surfactant being at least about $1.5\times+5$ wherein x represents the percent concentration of softener.

4,329,238

ANTIFRICTION PASTE AND SOLID ANTIFRICTION COATING PREPARED FROM SAME

Alla K. Mitrofanova, Chertanovskaya ulitsa, 53, korpus 1, kv. 160, and Militsa N. Zelenskaya, 2 Kvesisskaya ulitsa, 25, kv. 80, both of Moscow, U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,509

Int. Cl.³ C10M *5/02*

U.S. Cl. 252—12 **10 Claims**

1. A method of forming a solid antifriction lubricant coating comprising: forming an antifriction lubricant paste by contacting at ambient conditions the following components in the following proportions, in parts by weight:

epoxy resin: 40–80
molybdenum disulphide: 15–30
graphite: 10–15
aluminum: 5–10
copper: 5–10
alumosilicate: 8–15

contacting said antifriction lubricant paste with 5–10 parts by weight of polyethylenepolyamine at ambient conditions; applying said paste to the contact surfaces of a friction assembly; allowing said paste to cure at ambient conditions to form said solid antifriction lubricant coating.

6. An antifriction lubricant coating composition formed in accordance with the method of any of claims **1, 2, 3, 4** or **5**.

7. An ambient temperature curable composition for forming a solid antifriction lubricant coating consisting essentially of, in parts by weight:

epoxy resin: 40–80
molybdenum disulphide: 15–30
graphite: 10–15
aluminum: 5–10
copper: 5–10
alumosilicate: 8–15
polyethylenepolyamine: 5–10.

4,329,239

HYDROCARBYL DIHYDROURACIL, ITS METHOD OF PREPARATION AND LUBRICATING OIL COMPOSITION CONTAINING SAME

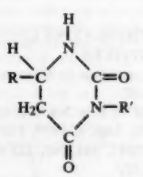
Kechia J. Chou, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed May 12, 1980, Ser. No. 149,222

Int. Cl.³ C10M *1/32*

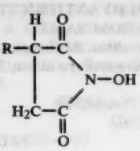
U.S. Cl. 252—51.5 A **21 Claims**

1. A hydrocarbyl-substituted dihydrouracil represented by the formula:



in which R is a hydrocarbyl radical having an average molecular weight ranging from about 150 to 2000, R′ is hydrogen, a hydrocarbyl radical having from 1 to 20 carbon atoms or an $R''—(X—R''')_y—$ radical in which R″ is an alkyl radical having from 1 to 12 carbon atoms, X is oxygen or an NH radical, R‴ is a divalent hydrocarbyl radical having from 1 to 3 carbon atoms and y is an integer from 1 to 3.

12. A method for preparing a 6-hydrocarbyl-substituted dihydrouracil which comprises reacting an N-hydroxy hydrocarbyl-substituted succinimide represented by the formula:

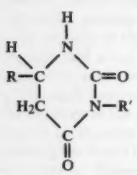


in which R is a hydrocarbyl radical having an average molecular weight ranging from about 150 to 2000, with p-toluenesulfonyl choride in the presence of an acid acceptor to produce an intermediate addition reaction product, and reacting said intermediate reaction product with an equimolar amount of a primary amine, said amine being represented by the formula:

$R'NH_2$

in which R' is hydrogen, a hydrocarbyl radical having from about 1 to 20 carbon atoms or an $R''(X—R''')_y$ radical in which R'' is an alkyl radical having from 1 to 12 carbon atoms, X is oxygen or an NH radical, R''' is divalent hydrocarbyl radical having from 1 to 3 carbon atoms and y is an integer from 1 to 3 to produce said 6-hydrocarbyl-substituted dihydrouracil.

14. A lubricating oil composition comprising a major proportion of a base oil of lubricating viscosity and from about 0.1 to about 5 percent by weight of a hydrocarbyl-substituted dihydrouracil represented by the formula:



in which R is a hydrocarbyl radical having an average molecular weight ranging from about 150 to 2000, R' is hydrogen, a hydrocarbyl radical having from 1 to 20 carbon atoms or an $R''—(X—R''')_y—$ radical in which R'' is an alkyl radical having from 1 to 12 carbon atoms, X is oxygen or an NH radical, R''' is a divalent hydrocarbyl radical having from 1 to 3 carbon atoms and y is an integer from 1 to 3.

4,329,240

LUBRICATING OIL COMPOSITIONS CONTAINING DISPERSANT ADDITIVES

Jennifer E. Lilburn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 54,119, Jul. 2, 1979, Pat. No. 4,274,837, which is a division of Ser. No. 931,232, Aug. 8, 1978, Pat. No. 4,197,409. This application Jan. 5, 1981, Ser. No. 222,479

Int. Cl.³ C10L *1/22*

U.S. Cl. 252—51.5 A **15 Claims**

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and from 0.01 to 20 weight percent of the dispersant additive hydrocarbylpoly(oxyalkylene)aminocarbamates having a molecular weight of from about 600 to 10,000, at least one C_1–C_{30} hydrocarbyl-terminated poly(oxyalkylene) chain and at least one basic nitrogen atom; wherein said poly(oxyalkylene) chain comprises from one to five oxyalkylene units each containing from 9 to 30 carbon atoms and other oxyalkylene units selected from 2 to 5 carbon oxyalkylene units.

4,329,241

MAGNETIC FLUIDS AND PROCESS FOR OBTAINING THEM

René Massart, Cesson, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Paris, France

Filed Jul. 10, 1980, Ser. No. 168,256

Claims priority, application France, Jul. 20, 1979, 79 18842

Int. Cl.³ G01N *27/82*; H01F *1/00*

U.S. Cl. 252—62.52 **11 Claims**

1. Ferrofluids consisting essentially of an aqueous solution free of surfactants of polyoxoanions of Fe(III) and at least one metal with an oxidation degree II selected from transition metals consisting of iron, cobalt, manganese, copper and nickel, with an associated cation selected from H^+, $N(CH_3)^+_4$ and $N(C_2H_5)^+_4$.

4,329,242

HYDRATED $Mg(NO_3)_2/MgCl_2$ REVERSIBLE PHASE CHANGE COMPOSITIONS

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 22, 1980, Ser. No. 219,009

The portion of the term of this patent subsequent to Jan. 9, 1998, has been disclaimed.

Int. Cl.³ C09K *5/06*; F24J *3/02*

U.S. Cl. 252—70 **9 Claims**

1. A reversible liquid/solid phase change composition comprising hydrated $Mg(NO_3)_2/MgCl_2$ and as a nuclearing additive, one or more of $Ca(OH)_2$, or CaO, added to the composition in an amount effective to suppress average supercooling of the $Mg(NO_3)_2/MgCl_2$ liquid phase to about 2° C. or less.

4,329,243

CAVITATION-INHIBITING, NONFREEZING, COOLING AND/OR HEAT-TRANSFER FLUIDS

Klaus Diebel, Marl, Fed. Rep. of Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 20, 1980, Ser. No. 198,379

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942903

Int. Cl.³ C09K *5/00*; C23F *11/10*

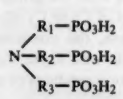
U.S. Cl. 252—75 **9 Claims**

1. A cavitation-inhibiting, nonfreezing, cooling and/or heat-transfer liquid, consisting essentially of water, a glycol, a cavitation inhibiting effective amount of at least one phosphonic acid of the formula

$$H_2O_3P—R—PO_3H_2$$

wherein

R is phenylene, C_{1-6}-alkylene, or phenylene or C_{1-6}-alkylene substituted by hydroxy, amino or PO_3H_2 groups, or of the formula,



wherein R_1, R_2, and R_3 each independently is a C_{1-4}-alkylene group or such a group whose carbon atom chain contains one or more N atoms each of which is attached to one or two groups of the formulae $R_1—PO_3H_2$, $R_2—PO_3H_2$ or $R_3—PO_3H_2$ as defined above,

and a corrosion inhibitor which is sodium benzoate, borax, sodium nitrite, a sodium phosphate, sodium carbonate, sodium nitrate, sodium silicate or a sulfur compound.

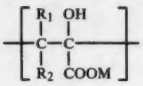
4,329,244

PARTICLES OF STABILIZED PEROXYGENATED COMPOUNDS, PROCESS FOR THEIR MANUFACTURE, AND COMPOSITION CONTAINING SUCH PARTICLES

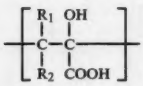
Jean Brichard, Vilvoorde; Jean-Claude Colery, Brussels, and Pierre Sarot, Vilvoorde, all of Belgium, assignors to Interox (Societe Anonyme), Brussels, Belgium

Filed Jun. 18, 1980, Ser. No. 160,817
Claims priority, application France, Jun. 21, 1979, 79 16344
Int. Cl.³ C11D 7/38, 7/18
U.S. Cl. 252—99 19 Claims

1. Particles comprising at least one inorganic peroxygenated compound and, as stabiliser therefor, a polymer (a) containing monomeric units of the formula



wherein R_1 and R_2 represent hydrogen and an alkyl group containing from 1 to 3 carbon atoms and where M represents an alkaline earth metal atom or a mixture of an alkaline earth metal inorganic salt and a polymer (b) selected from the group consisting of polylactones derived from polymers of alpha-hydroxyacrylic acid, containing monomeric units of the formula



wherein R_1 and R_2 have the same meaning as above and their alkali metal salts.

4,329,245

BLEACHING DETERGENT COMPOSITIONS

Philip R. N. Eymond, and Robert M. Butterworth, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 19, 1981, Ser. No. 245,467
Claims priority, application United Kingdom, Mar. 21, 1980, 8009636
Int. Cl.³ C11D 7/54
U.S. Cl. 252—102 7 Claims

1. A bleaching detergent composition comprising:
(a) 3 to 40% by weight of a detergent active compound comprising a nonionic detergent;
(b) 3 to 35% by weight of an inorganic persalt;
(c) 0.1 to 15% by weight of an organic peracid precursor, which can react with the persalt to form organic peracids;
(d) 0.02 to 2% by weight of a fluorescent agent selected from the group consisting of:
(i) derivatives of 4,4'-di(sym-triazinylamino)-stilbene-2,2'-disulphonic acid and their salts;
(ii) derivatives of diphenyl-distyryl compounds and their salts;
(iii) derivatives of 4,4'-di(triazolyl)-stilbene-2,2'-disulphonic acid and their salts; and
(iv) derivatives of diphenyl-2-pyrazoline; and
(e) 0.1 to 5.0% by weight of an alkanolamine, in which the alkanol moiety is a lower alcohol having 2 to 4 carbon atoms.

4,329,246

ALKALINE DISHWASHER DETERGENT

Lawrence A. Gilbert, Fairfield; Robert A. Staab, Cincinnati; Royal D. Collins, Bethel, and Charles R. Ries, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 7, 1977, Ser. No. 849,132
Int. Cl.³ C11D 7/56
U.S. Cl. 252—103 16 Claims

1. An automatic dishwashing composition providing optimum cleaning and spotting and filming characteristics consisting essentially of:
(1) from about 20% to about 50% of a sequestering builder selected from the group consisting of alkali metal, tripolyphosphates and pyrophosphates;
(2) from about 8% to about 20% trisodium phosphate;
(3) from about 5% to about 20% of SiO_2 as an alkali metal silicate having an SiO_2:M_2O ratio of from about 1.6 to about 3.3, wherein M is selected from the group consisting of sodium and potassium;
(4) available chlorine at a level of from about 1% to about 3%; and
(5) from about 2.5% to about 15% of a low foaming nonionic surfactant
said composition having a pH of from about 10.5 to 11.2 at 2,500 ppm and being completely free of materials having a pH of 12 or more at a concentration of 1% in water and being substantially free of organic chelating builders.

4,329,247

STAIN REMOVER FOR VINYL MATERIALS

Lewis B. Palmer, St. Paul, Minn., assignor to PDI, Inc., St. Paul, Minn.

Filed Nov. 6, 1980, Ser. No. 204,492
Int. Cl.³ C11D 7/52, 9/04
U.S. Cl. 252—104 5 Claims

1. A stain remover for vinyl surfaces consisting of a formulation having the following composition:

Component	Volume [Percent]
(a) A solvent selected from the group consisting of ethylene glycol monoalkyl ethers having the structural formula $HO-CH_2-CH_2-O-(R)$ wherein R represents an alkyl group having up to 4 carbon atoms; ethylene glycol monoalkyl ether acetate selected from the group consisting of $CH_3-\overset{O}{\overset{\|}{C}}-O-CH_2-O-(R_1)$ wherein R_1 represents an alkyl group having up to 4 carbon atoms; selected from the group consisting of [specifically] ethylene glycol monobutyl ether and mixtures thereof;	5%–80%
(b) Fumed silica;	5%–20%
(c) Calcium hypochlorite or sodium hypochlorite (5% to 10% solution in water).	5%–20%

4,329,248

PROCESS FOR THE TREATMENT OF HIGH LEVEL NUCLEAR WASTES

Alfred E. Ringwood, Red Hill, Australia, assignor to The Australian National University, Australia

Filed Feb. 26, 1980, Ser. No. 124,953
Claims priority, application Australia, Mar. 1, 1979, PD7866; Jul. 26, 1979, PD9727
Int. Cl.³ G21F 9/16
U.S. Cl. 252—628 36 Claims

1. A process for immobilizing high level nuclear waste containing a major proportion of aluminium and/or iron compounds which comprises the steps of (1) mixing the waste with a minor proportion of a mixture of oxides selected from the group consisting of TiO_2, ZrO, SiO_2, Al_2O_3, CaO, SrO and BaO, at least one of the selected oxides being from the group consisting of TiO_2, ZrO_2 and SiO_2, the oxides in said mixture and the relative proportions thereof being selected so as to form a mixture which when heated at temperatures between 800° and 1400° C. crystallizes to produce a mineral assemblage containing (i) crystals belonging to or possessing structures closely related to the titanate mineral classes capable of providing lattice sites in which the fission product and actinide elements of said waste are securely bound, and (ii) crystals thermodynamically compatible with said crystals (i) comprising at least one non-radioactive phase containing aluminium and/or iron, said crystals (i) and (ii) belonging to or possessing crystal structures closely related to crystals belonging to mineral classes which are resistant to leaching and alteration in geologic environments; and (2) heating at a temperature within said range and then cooling said mixture under reducing conditions so as to cause crystallization of the mixture to a mineral assemblage having the fission product and actinide elements of said waste incorporated as solid solutions within the crystals (i) thereof, and aluminium and/or iron crystallized in said at least one non-radioactive crystal phase (ii).

4,329,249

CARBOXYLIC ACID DERIVATIVES OF ALKANOL TERTIARY MONOAMINES AND LUBRICANTS OR FUNCTIONAL FLUIDS CONTAINING THE SAME

John W. Forsberg, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Sep. 27, 1978, Ser. No. 946,294
Int. Cl.³ C10M 1/32; C07C 69/593
U.S. Cl. 252—34.7 16 Claims

1. A nitrogen-containing, phosphorus-free carboxylic acid derivative made by reaction of a mixture consisting essentially of:

(A) at least one carboxylic acid acylating agent having at least one hydrocarbyl-based substituent of about 50 to about 500 carbon atoms;

(B) at least one alkanol tertiary monoamine having the formula

wherein each R is a lower alkyl group and R′ is an alkylene group of two to about eighteen carbon atoms; and

(D) at least one other alkanol amine having the formula R_1R_2N-R_3-OH, wherein R_1 and R_2 are each hydrogen, alkyl, alkenyl, hydroxy alkyl or hydroxy alkenyl and R_3 is alkylene;

the amount of said other alkanol amine (D) being no more than about 50 mole percent of the amount of (B) and (D) combined; and

the equivalent ratio of acylating agent (A) to the amount of (B) and (D) combined is in the range of about 1:0.5 to about 1:3.0.

4,329,250

LOW LEVEL CHROMATE-BASED CORROSION INHIBITION IN AQUEOUS MEDIUMS

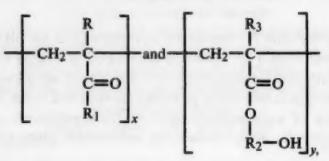
Frederick G. Vogt, deceased, late of Philadelphia, Pa. (by Mary J. Vogt, executrix), and Patricia T. Sparrell, Freehold, N.J., assignors to Laboratories, Inc. Betz, Trevose, Pa.

Filed Mar. 28, 1980, Ser. No. 134,813
The portion of the term of this patent subsequent to Oct. 27, 1998, has been disclaimed.
Int. Cl.³ C23F 11/12, 11/14, 11/18
U.S. Cl. 252—389 R 13 Claims

1. A zinc-free and phosphate-free composition consisting essentially of in combination:

(i) water-soluble chromate, and

(ii) water-soluble polymer comprising moieties derived from acrylic acid or water-soluble salt thereof and moieties of hydroxylated lower alkyl acrylate, wherein the moieties of said polymer have the following formulas:



where R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, NH_2 or OM where M is a water-soluble cation; R_2 is a lower alkyl of about 2 to 6 carbon atoms, R_3 is H or lower alkyl of from 1 to 3 carbon atoms and the mole ratio of x:y is 1:4 to 36:1.

4,329,251

TITANIUM TRICHLORIDE CATALYTIC COMPONENT AND METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Yoichi Sunada, Shin-nanyo; Yoshikazu Takahashi, Hikari, and Masaru Takitani, Shin-nanyo, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1980, Ser. No. 161,334
Claims priority, application Japan, Jun. 29, 1979, 54-83220
Int. Cl.³ C08F 4/64
U.S. Cl. 252—429 B 7 Claims

1. A titanium trichloride catalytic component for α-olefin polymerization and which is prepared by separation, in the presence of an olefin of not more than 6 carbon atoms, of a titanium trichloride catalytic component from a solution prepared by dissolving (1) titanium tetrachloride, (2) an organic ether compound represented by the formula ROR′, wherein R and R′ are alkyl groups which are the same or different with at least one of them having not more than 5 carbon atoms, and (3) an organo-aluminum compound represented by the formula AlR_nX_{3-n} wherein R is an alkyl group of 1 to 10 carbon atoms, X is halogen or hydrogen and $0<n\leqq 3$ in a mixed solvent which is prepared by allowing 20 to 70% by volume of an aromatic hydrocarbon halide to be concomitant with a saturated aliphatic hydrocarbon and/or alicyclic hydrocarbon; said organo-aluminum compound, said titanium tetrachloride and said organic ether compound being added to said mixed solvent at a solvent temperature not exceeding 55° C.; thereafter, increasing the solvent temperature to a value between 45° and 150° C. over a period between 10 minutes and 24 hours and, during the process of increasing the temperature, adding an additional amount of said organic ether compound and/or said titanium tetrachloride to said solution, to enable said titanium trichloride catalytic compound to be separated from the solution in the form of uniform particles having an average diameter of between 10 and 500μ.

4,329,252

OLEFINE POLYMERIZATION CATALYST AND THE PRODUCTION AND USE THEREOF

Paul D. Gavens, Lower Stondon, and Malcolm P. Rochefort, Luton, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 24,366, Mar. 27, 1979, Pat. No. 4,263,168. This application Jan. 10, 1980, Ser. No. 110,996

Claims priority, application United Kingdom, Jan. 10, 1979, 7900943

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **15 Claims**

1. A process for the production of a composition suitable for use as a component of an olefine polymerisation catalyst, which process comprises treating a component I which is at least one solid inorganic oxide with a component II which is a magnesium hydrocarbyl halide compound, a component III which is an organic Lewis Base compound which affects either the activity or stereospecificity of a Ziegler polymerisation catalyst system and a component IV which is titanium tetrachloride, wherein component III is an ether, a ketone, an alcohol, an ortho-ester, a sulphide, an ester of a thiocarboxylic acid, a thioketone, a thiol, a sulphone, a sulphonamide, a fused ring compound containing a heterocyclic sulphur atom, an organosilicon compond, an amide, urea, a substituted derivative of urea, thiourea, an amine, an organo-phosphine, an organo-phosphine oxide, an organo-phosphite or an organo-phosphate, and

(A) component I is reacted with component II;

(B) the product of stage (A) is reacted with either component III or component IV; and

(C) the product of stage (B) is reacted with whichever of component III or component IV is not used in stage (B).

4,329,253

OLEFIN POLYMERIZATION CATALYST COMPONENT AND COMPOSITION AND METHOD OF PREPARATION

Brian L. Goodall; Adrianus A. Van der Nat, and Willem Sjardijn, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 25, 1980, Ser. No. 143,578

Claims priority, application United Kingdom, Apr. 30, 1979, 7914918

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **22 Claims**

1. A solid constituent for olefin polymerization catalysts obtained by

i contacting a solid reaction product comprising a magnesium halide in which the atomic ratio of halogen to magnesium is at least 1.2:1, a titanium halide and an electron donor with a halohydrocarbon in liquid phase;

ii optionally washing the resulting solid with an inert diluent to remove liquid remaining from the contacting step;

iii contacting the resulting solid with a halide of tetravalent titanium in liquid phase; and

iv washing the resulting solid with an inert diluent to remove residual unreacted titanium compound.

4,329,254

MERCURO-ORGANIC BONDED PHASE SORBENTS

Jan Chmielowiec, 1030 King St. #13, Ottawa, Ontario, Canada (K1Z 6K9)

Filed Jul. 9, 1980, Ser. No. 167,028

Claims priority, application Canada, Feb. 29, 1980, 346787

Int. Cl.³ B01D *15/08;* C07C *7/12*

U.S. Cl. 252—430 **25 Claims**

1. A sorbent material for chromatography comprising an organomercuric moiety chemically bonded to a solid support substrate, wherein said organomercuric moiety comprises an organic link and a mercury moiety, wherein the organic link is chemically bonded to the support substrate and to the mercury moiety, said organic link being an aromatic hydrocarbon.

4,329,255

CATALYST COMPOSITION

David L. Beach, Gibsonia; Richard W. Lunden, Pittsburgh, both of Pa., and Adolfo Zambelli, Milan, Italy, assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 29, 1980, Ser. No. 220,315

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **30 Claims**

1. A novel catalyst system comprising (A) the solid product obtained by (1) treating a polymeric support carrying a magnesium compound selected from the group consisting of magnesium halides, magnesium nitrates, magnesium alkoxides, magnesium phenates and magnesium carboxylates with a titanium halide and (2) reacting the product of (1) with an aluminum hydrocarbyl; (B) an activator selected from the group consisting of aluminum hydrocarbyls and magnesium hydrocarbyls; and (C) at least one non-halide-containing organic oxygenated titanium compound selected from the group consisting of titanium alkoxides and titanium phenoxides, wherein the molar ratio of titanium in Component C to titanium in Component A is in the range of about 5:1 to about 50:1.

4,329,256

PROCESS FOR THE MANUFACTURE OF A MIXED CATALYST

Kurt Rust, Kelkheim; Ludwig Brinkmann, Frankfurt am Main, and Paul Lutz, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 54,922, Jul. 5, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,665

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2830039

Int. Cl.³ C08F *4/02, 4/64*

U.S. Cl. 252—429 B **19 Claims**

1. A process for the manufacture of a mixed catalyst which comprises

to form a first component, contacting the titanium trichloride-containing reaction product of reduction, in an inert diluent at a temperature of from −50° C. to +80° C., of titanium tetrachloride by an organic compound of a metal of main group I, II or III of the Periodic Table of the elements with a magnesium halide complex, obtained by reacting a magnesium halide with an electron donor selected from the group consisting of benzoic acid ethyl ester, benzoic acid methyl ester, p-toluic acid ethyl ester, p-toluic acid methyl ester, anisic acid ethyl ester, anisic acid methyl ester, cycloheptatriene-1,3,5 and cyclooctatetraene, and

mixing with said first component a halogen-free organoaluminum compound and a stereoregulator selected from the group consisting of cyclopolyenes, phosphinic acid esters, hexamethyl-phosphoric acid trisamide, 1,2-dimethoxybenzene and aromatic carboxylic acid esters with the provision that said halogen-free organo-aluminum compound and stereoregulator are substantially unreacted with one another.

4,329,257

METHOD OF PRODUCING A CATALYST FROM CLAY MINERALS FOR THE HYDRATION OF OLEFINS

August Sommer; Wilhelm Heitmann, both of Herne, and Rainer Brücker, Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Kreis Recklinghausen, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,287

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929919

Int. Cl.³ B01J *27/14, 29/00*

U.S. Cl. 252—435 **12 Claims**

1. A method for producing a catalyst comprising phosphoric

acid and a carrier, for the hydration of olefins with 2–3 carbon atoms to the corresponding alcohols, the method comprising:

contacting a clay, containing essentially montmorillonite, contaminated by no more than 3% accompanying minerals and containing up to 0.5% by weight K_2O, or a mineral of the montmorillonite group, containing no potassium, but having the montmorillonite crystalline lattice, with an acid until it has an Al_2O_3 content of 13–18% by weight and a surface area of 200–400 m^2/g;

admixing the so-treated clay with 5–15% by weight, based on the total dry admixture, of one or more oxides of metals of Group VI of the Periodic System;

adjusting the water content of the admixture to 20–35% by weight;

pressing the admixture into a desired shape and calcining at 500°–800° C.;

treating the so-formed carrier material with an acid until it has an Al_2O_3 content of 1–5% by weight and a specific surface area of 150–250 m^2/g; and

then impregnating the resulting carrier with phosphoric acid.

4,329,258

CATALYSTS FOR THE HYDROTREATMENT OF HYDROCARBONS AND USE THEREOF IN THE REFORMING AND ISOMERIZATION OF HYDROCARBONS IN THE PRESENCE OF HYDROGEN

Philippe Engelhard, and Georges Szabo, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed May 21, 1980, Ser. No. 152,126

Claims priority, application France, May 22, 1979, 79 13029

Int. Cl.³ B01J *27/08, 27/10*

U.S. Cl. 252—441 **12 Claims**

1. In a catalyst for the hydrotreatment of hydrocarbons which comprises:

a refractory oxide-mineral carrier;

a halogen element, present in combined form; and,

in free or combined form,

(a) from 0.02 to 2%, based on the total weight of the catalyst, of at least one metal M1 from the platinum group, and

(b) from 0.02 to 2%, based on the total catalyst weight, of tin,

the improvement in said catalyst wherein it comprises in combined form, at least one metal M2 selected from groups Ia and IIa of the periodic table of the elements in such an amount that the ratio M2/M1 of the number of atoms of the metal M2 to the number of atoms of the metal M1 is such that $0.2 \leqq M2/M1 \leqq 10$.

4,329,259

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 67,082, Aug. 16, 1979, abandoned, which is a division of Ser. No. 931,806, Aug. 7, 1978, Pat. No. 4,207,170. This application Oct. 20, 1980, Ser. No. 198,731

Int. Cl.³ B01J *27/08, 27/10*

U.S. Cl. 252—441 **8 Claims**

1. An acidic catalyst composite and a porous carrier material consisting essentially of on an elemental basis, about 0.01 to about 2 wt. % platinum, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % cadmium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum, catalytically available nickel, and cadmium components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum component is present in the elemental metallic state; wherein substantially all of the cadmium component is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available nickel component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state or in a mixture of these states.

4,329,260

INTEGRAL SHAPED REPLICATION SUPPORTS

George R. Lester, Park Ridge, and Lawrence B. Welsh, Evanston, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 78,341, Sep. 24, 1979, abandoned. This application Dec. 8, 1980, Ser. No. 214,356

Int. Cl.³ B01J *21/18, 23/40*

U.S. Cl. 252—446 **29 Claims**

1. A method for the preparation of an integral shaped replication in the form of a sphere, plate or pellet of a shaped, porous and dissolvable substrate material which possesses physical dimensions, shape, in the form of a sphere, plate or pellet, and an ABD suitable for use as an adsorbent in a fixed bed adsorption process, said replication duplicating said physical shape and dimension of said substrate material and a substantial portion of the pore structure thereof, which replication consists essentially of a carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms and which replication has an ABD which is about 25% to about 100% of the ABD of said substrate material, which comprises the steps of:

(a) treating said substrate material in the form of a sphere, plate or pellet with an organic pyrolyzable precursor compound in a reducing atmosphere at a temperature in the range of from about 400° to about 1200° C. to pyrolyze said organic compound to form said carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms in the pore structure of said substrate material,

(b) continuing the treatment of step (a) until the total accumulation of said carbonaceous pyropolymer in the pore structure of said substrate is sufficient to result in a replication which possesses a crush strength of from about 0.5 to about 14 kg, and

(c) recovering the integral shaped replication in the form of a sphere, plate or pellet comprising a carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms by leaching said substrate material from the product of step (b) by contacting said product with a dissolving agent for said substrate material under conditions selected to dissolve substantially all of said substrate material.

4,329,261

LIQUID BAND PASS FILTERS

Robert J. Kraushaar, Tenafly, N.J., and Kevin B. Ward, Bayside, N.Y., assignors to International Standard Electric Corporation, New York, N.Y.

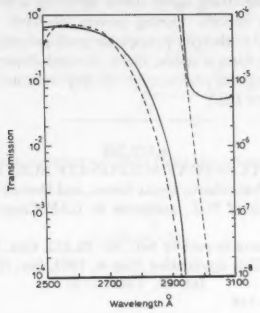
Filed Feb. 28, 1980, Ser. No. 125,431

Int. Cl.³ G02B *5/24*

U.S. Cl. 252—582 **2 Claims**

1. A method of filtering light to selectively transmit ultravio-

let, which comprises; inserting in the path of said light a band pass filter which comprises a glycerol solution of 2,7-dimethyl-



diaza-(3,6)-cycloheptadien-(1,6)-perchlorate having a concentration in the range of 0.1 grams per liter to 2.0 grams per liter.

4,329,262

INITIALLY ERASABLE INK COMPOSITION FOR A BALL POINT WRITING INSTRUMENT

Frank A. Muller, West Los Angeles, Calif., assignor to Scripto, Inc., Doraville, Ga.

Filed Mar. 25, 1981, Ser. No. 247,363
Int. Cl.³ C09D *3/36*; C08L *9/00*
U.S. Cl. 523—161 **22 Claims**

1. In a ball point writing instrument containing an ink capable of depositing a trace on an absorbent, paper-like writing surface having minute voids therein, said trace being characterized by initial erasability thereof by ordinary pencil erasers and thereafter developing permanence over a period of time; said ink comprising an elastomer selected from the group consisting of natural rubbers, a synthetic rubber which essentially duplicates the chemical structure of natural rubber, and mixtures thereof, pigment, and a solvent system for said elastomer, said elastomer being present in the range of about 18–28% by weight of the ink, said pigment being present in the range of about 10–22% by weight of the ink, said solvent system comprising a volatile component present in the range of about 8–30% by weight of the ink and having a boiling point less than about 180° C. and an essentially non-volatile component being present in the range of about 21–50.5% by weight of the ink and having a boiling point less than about 300° C. and greater than about 180° C.

4,329,263

ACCELERATOR SYSTEMS FOR POLYESTER RESIN COMPOSITIONS

Frederick J. Buono, Robbinsville, N.J., and Samuel Hoch, Brooklyn, N.Y., assignors to Tenneco Chemicals, Inc., Piscataway, N.J.

Filed Dec. 1, 1980, Ser. No. 211,548
Int. Cl.³ C08L *67/06*; C08F *4/34*
U.S. Cl. 525—17 **14 Claims**

1. In the process for the curing of an unsaturated polyester resin composition that comprises contacting a composition comprising an unsaturated polyester resin and an unsaturated monomer capable of reacting with said unsaturated polyester resin to form cross-linkages with an organic peroxide catalyst and an accelerator system that comprises cobalt and potassium salts of monocarboxylic acids, the improvement wherein the accelerator system comprises at least one cobalt salt of a monocarboxylic acid having 6 to 12 carbon atoms and at least one potassium salt of a monocarboxylic acid having 1 to 5 carbon atoms, said system being present in an amount that will provide from 0.001% to 0.1% of cobalt and 0.001% to 0.1% of potassium, based on the weight of the unsaturated polyester resin.

10. An accelerator system for peroxide-catalyzed unsaturated polyester resin compositions that is a solution of a metal compound selected from the group consisting of a mixture of cobalt salts of monocarboxylic acids having 6 to 12 carbon atoms and potassium salts of monocarboxylic acids having 1 to 5 carbon atoms, reaction products of said cobalt and potassium salts, and mixtures thereof in an organic solvent that contains from 20% to 80% by weight of at least one polar solvent and from 20% to 80% by weight of at least one non-polar solvent, said solution containing from 3% to 6% by weight of cobalt (as metal) and from 5% to 10% by weight of potassium (as metal) and having a total metal content of from 8% to 15% by weight.

4,329,264

BALLPOINT WRITING INSTRUMENT CONTAINING AN INITIALLY ERASABLE INK

Frank A. Muller, Los Angeles, Calif., assignor to Scripto, Inc., Doraville, Ga.

Filed Apr. 3, 1980, Ser. No. 136,787
Int. Cl.³ C08K *5/01*
U.S. Cl. 523—162 **9 Claims**

1. In a ballpoint writing instrument containing a supply of ink capable of producing an intense colored line when deposited on a writing paper surface which line is capable of erasure within several hours after deposit by the use of a conventional pencil eraser without causing damage to the writing paper surface but which thereafter sets up to produce a permanent non-erasable line, said ink consisting essentially of an elastomeric polymer present in an amount between 20 and 36% by weight dissolved in an essentially non-volatile hydrocarbon solvent or plasticizer present in an amount between 36 and 68% by weight, said solvent or plasticizer being a light mineral oil having a viscosity at 20° C. of around 1.5 centipoises, being present in amount relative to said polymer such as to impart a final ink viscosity in the range $1\text{-}4X10^6$ centipoises, and having a boiling point in the range 180°–290° C., and pigment particles present in the amount of 12 to 26% by weight evenly dispersed in the plasticized elastomer polymer solution, the pigment being present in amount relative to said polymer as to impart intensity while preserving the capability of initial erasure of said line.

4,329,265

OUTSIDE TIRE PAINT

Victor L. Hallenbeck, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 31, 1980, Ser. No. 136,006
The portion of the term of this patent subsequent to Apr. 2, 1999, has been disclaimed.
Int. Cl.³ C08L *91/00*
U.S. Cl. 524—496 **5 Claims**

1. An outside tire painting comprising

a. at least one rubber latex, wherein said latex is selected from the group consisting of natural rubber latex and styrene butadiene latex,

b. a wax dispersion containing paraffin wax,

c. nonpelletized carbon block having a particle size greater than 50 millimicrons,

d. water and

e. surfactant, wherein said paint is substantially free of silicone and hydrocarbon solvents and has a solids content of from about 20 to about 30 percent.

4,329,266

WATER-DISPERSED COATING COMPOSITION COMPRISING AN ACRYLIC GRAFT POLYMER CONTAINING CARBOXYL GROUPS, HYDROXYL AND/OR AMIDE GROUPS

Yukio Suzuki; Naozumi Iwasawa, and Tadashi Watanabe, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Sep. 12, 1980, Ser. No. 186,557

Claims priority, application Japan, Sep. 29, 1979, 54-124710; Sep. 29, 1979, 54-124711

Int. Cl.³ C08L *61/28*

U.S. Cl. 524—376 **27 Claims**

1. A water-dispersed coating composition comprising

(1) a dispersion of a water-dispersible form of an acrylic graft polymer containing carboxyl groups and hydroxyl and/or amide groups in an aqueous medium containing 60 to 90% by weight of water, said water-dispersible form being obtained by neutralizing at least 50% of the carboxyl groups of said acrylic graft polymer with a basic substance, said acrylic graft polymer having, prior to said neutralization, an acid value of 15 to 40 and a glass transition temperature of −10° C. to 70° C. and being produced by polymerizing, at a temperature of from about 60° to about 150° C., (A) an acrylic copolymer containing carboxyl groups, unsaturated groups and optionally hydroxyl and/or amide groups, said acrylic copolymer being obtained by reacting 100 parts by weight of an acrylic polymer having carboxyl groups and optionally hydroxyl and/or amide groups with 0.2 to 3.0 parts by weight of an unsaturated monomer containing a glycidyl group in a hydrophilic organic solvent, and (B) a mixture of an alpha,beta-ethylenically unsaturated carboxylic acid and another copolymerizalbe unsaturated monomer, the weight ratio of (A) to (B) being 5–95 parts of (A) to 5–95 parts per total of 100 parts of (A) and (B), said other copolymerizable unsaturated monomer optionally containing a copolymerizable unsaturated monomer having hydroxyl and/or amide groups, said acrylic copolymer (A) and said mixture (B) being selected so that either one of them has hydroxyl and/or amide groups and the difference between the acid value of said acrylic copolymer (A) and the acid value of said mixture (B) is from 25 to 200, and

(2) at least one amino resin selected from the group consisting of melamine/formaldehyde resin, urea/formaldehyde resin, guanamine/formaldehyde resin, benzoguanamine/formaldehyde resin and acetoguanamine/formaldehyde resin.

4,329,267

PROCESS FOR THE PREPARATION OF ETHYLENE-VINYL ESTER GRAFT POLYMER DISPERSIONS

Klaus Riebel; Heinrich Alberts, both of Cologne; Herbert Bartl, Odenthal; Fritz Mietzsch, Cologne, and Ulrich Steffen, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,996

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3008748

Int. Cl.³ C08L *00/00*

U.S. Cl. 523—323 **7 Claims**

1. A process for preparing a stable, finely divided dispersion of an ethylene-vinyl ester graft polymer which comprises the steps of (1) polymerizing in organic solution a mixture comprising

(A) 95–25% by weight of an ethylene/vinyl ester copolymer having a vinyl ester content of 25–75% by weight;

(B) 5–75% by weight of a vinyl ester of a C_1–C_{18}-carboxylic acid and/or a C_1–C_{10}-alkyl ester of acrylic acid and/or methacrylic acid; and

(C) 0–40% by weight of a cross-linking agent having two or more carbon to carbon double bonds until at least 25% by weight of component (B) has been reacted, (2) adding a precipitating agent in the absence of an emulsifying agent and/or dispersing agent while applying a shearing force having a specific mixing power of from 10^{-3} to 25 Watt/cm³ to thereby precipitate graft polymer and simultaneously form a stable, finely divided dispersion and (3) completing polymerization of any residual amount of component (B).

4,329,268

POLYETHYLENEOXY SULFONATE SURFACTANTS

Paritosh M. Chakrabarti, Cedar Grove, and Darrell G. Kirchner, Vernon, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 81,322, Oct. 3, 1979, abandoned. This application May 4, 1981, Ser. No. 260,466

Int. Cl.³ C08F *2/30*

U.S. Cl. 524—166 **16 Claims**

1. An aqueous emulsion comprising the reaction product of a vinyl acid monomer and at least a second copolymerizable monomer, said vinyl acid monomer being present in an amount equal to about 5% to about 50% by weight based on a total weight of said vinyl acid monomer and said at least a second copolymerizable monomer, said surfactant being present in an amount equal to about 0.1 to about 10 weight percent based on the total weight of said vinyl acid monomer and said at least a second copolymerizable monomer, said surfactant being represented by the formula:

$$R_1(R_2)_y—O—(CH_2CH_2O)_{n-1}CH_2CH_2SO_3Me$$

wherein;

y is 0 or 1;

R_1 is an alkyl having at least 6 carbon atoms;

R_2 is an aryl group;

n is at least 3; and

Me is NH_4, Na, Li and K.

4,329,269

ONE PACKAGE SYSTEM COLD-SETTING TYPE COATING COMPOSITIONS

Naomitsu Takashina, Yokohama; Masahiro Shimoi, Hiratsuka, and Yoshinori Iwamoto, Odawara, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 16, 1981, Ser. No. 225,516

Claims priority, application Japan, Jan. 16, 1980, 55-3207

Int. Cl.³ C08K *5/07*

U.S. Cl. 525—366 **4 Claims**

1. A one-package system cold-setting type coating composition which comprises (i) an acrylic copolymer having carboxyl groups in its molecule or an alkyd resin, (ii) an aluminum alkoxide complex, (iii) a keto-enol tautomeric compound, (iv) a solvent and (v) from about 0.01 to about 1.0 percent by weight of at least one alkali metal hydroxide based on the weight of the composition comprising (i), (ii), (iii) and (iv).

4,329,270

COMPOSITIONS CONTAINING PLASTICIZED POLY(VINYL CHLORIDE) WHICH COMPOSITIONS HAVE IMPROVED PHYSICAL PROPERTIES

Max F. Meyer, Jr.; Richard L. McConnell, and Frederick B. Joyner, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

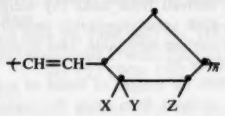
Filed Sep. 4, 1980, Ser. No. 183,880

Int. Cl.³ C08K *5/10*; C08L *45/00*

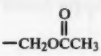
U.S. Cl. 524—518 **16 Claims**

1. A compatible plasticized poly(vinyl chloride) composition having excellent clarity and a flexural stiffness of 89,800 or less comprising: (1) a poly(vinyl chloride) having a molecular weight of 30,000 to 200,000 number average molecular weight, (2) about 5 phr to 30 phr plasticizer and (3) about 5 to 80

weight percent of a polar substituted polynorbornene consisting predominantly of repeating units having the formula



wherein X is a member selected from the group —COOR;



or

where R is a hydrocarbyl group containing 1 to 8 carbon atoms, Y is hydrogen or methyl and Z is hydrogen or —COOR which is the same as for X and n is an integer of from 10 to 5,000.

4,329,271

FLEXIBLE CERAMIC TAPE AND METHOD OF MAKING SAME

Miro Kemr, San Francisco, and Howard Mizuhara, San Mateo, both of Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 15, 1980, Ser. No. 216,240
Int. Cl.³ C08K *5/05, 5/13*
U.S. Cl. 524—386 **4 Claims**

1. A flexible ceramic composition consisting, in dry weight, of 2–4% polyacrylic acid polymer having a molecular weight of approximately 450,000, 9–14% glycerol and the balance a ceramic substance consisting of alumina.

4,329,272

FLAME-RETARDANT POLYMERS

Daniel L. Dufour, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 17, 1981, Ser. No. 244,577
Int. Cl.³ C08K *5/02;* C08L *37/00, 51/00;* C08K *5/49*
U.S. Cl. 524—288 **4 Claims**

1. A molding composition comprising:

A. from 30 to 40% by weight of a uniform polymer comprising 50 to 85% by weight of a vinylaromatic monomer, from 15 to 30% by weight of an unsaturated dicarboxylic acid anhydride and from 0 to 20% of a copolymerizable monomer;

B. from 30 to 40% by weight of polyvinyl chloride; and

C. from 30 to 40% by weight of a composition comprising a graft copolymer of from 20 to 40% by weight of a monomer selected from the group consisting of methyl methacrylate and acrylonitrile and 80 to 60% by weight of a vinyl aromatic monomer, said copolymer being grafted on to from 10 to 60% of the weight of the composition of a substrate rubber having a glass transition temperature below 0° C.

4,329,273

SELF-BONDING SILICONE RUBBER COMPOSITIONS

Bruce B. Hardman, Clifton Park, and George M. Dujack, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 20,104, Mar. 12, 1979, abandoned, which is a continuation of Ser. No. 884,461, Mar. 7, 1978, abandoned. This application May 2, 1980, Ser. No. 145,944
Int. Cl.³ C08L *83/04*
U.S. Cl. 524—862 **10 Claims**

1. A self-bonding silicone rubber composition comprising (A) 100 parts by weight of a base polymer of the formula,

where R is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, and x is such that the viscosity of the base polymer varies from 100 to 200,000,000 centipoise at 25° C.; (B) from 0.5 to 50 parts by weight of a hydride siloxane cross-linking agent; (C) from 1 to 500 parts per million of platinum catalyst; and (D) from 0.1 to 5 parts by weight of a self-bonding additive which is the partial hydrolysis product of a compound of the formula,

$$R_a^1Si\,(OR^3)_{4-a}$$

wherein R^1 is an aliphatic unsaturated radical selected from the class consisting of alkenyl radicals and alkynyl radicals of 2 to 8 carbon atoms, R^3 is selected from the class consisting of alkyl radicals and cycloalkyl radicals of 1 to to 8 carbon atoms and a is 1 and wherein the partial hydrolysis product is such that on the average 16 to 49 mole percent of the hydrocarbonoxy groups of said silane are hydrolyzed.

7. The composition of claim **1** wherein the reinforcing filler is selected from the class consisting of fumed silica and precipitated silica.

4,329,274

HEAT CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Robert A. Faltynek, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,718
Int. Cl.³ C08L *83/04*
U.S. Cl. 524—862 **9 Claims**

2. A heat curable organopolysiloxane composition comprising,

(A) a silicone composition comprising,

(i) 100 parts of a vinyl containing diorganopolysiloxane and

(ii) 10 to 20 parts of silicon hydride containing siloxane comprising a member selected from the class consisting of silicon hydride resin consisting essentially of chemically combined diorgano hydride siloxy units and SiO_2 units, linear hydride polysiloxane consisting essentially of chemically combined hydro organosiloxy units and diorganosiloxy, a linear hydride polysiloxane coupler consisting essentially of chemically combined diorganosiloxy units and terminal diorgano hydride siloxy units, and mixtures thereof, and

(B) an effective amount of the platinum catalyst having the formula,

$$[Pt(CH_3)_3(X)]_4,$$

where X is a halogen radical selected from iodo, chloro and bromo.

5. A heat curable composition in accordance with claim **2**,

where the vinyl containing diorganopolysiloxane is a mixture of a vinyl end-stopped polydimethylsiloxane having a viscosity of from 50,000 to 80,000 centipoises, a dimethylvinyl-terminated polydimethylsiloxane resin having about 2 mole percent of chemically combined vinyl dimethylsiloxy units, a dimethylvinyl-terminated polydimethylsiloxane fluid having viscosity of about 40,000 centipoises, the silicon hydride siloxane is a dimethyl hydrogen-terminated polydimethylsiloxane fluid having a viscosity of about 1,000 centipoises, and the heat curable composition is reinforced with a mixture of fumed silica and ground quartz.

4,329,275

HEAT-CURABLE POLYSILOXANE COMPOSITION

Masayuki Hatanaka, Ouramachi, and Atsushi Kurita, Ohta, both of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1980, Ser. No. 171,526

Claims priority, application Japan, Jul. 27, 1979, 54-95848; Jul. 27, 1979, 54-95849

Int. Cl.³ C08L *83/06;* C08G *77/08*

U.S. Cl. 524—862 **28 Claims**

1. A curable polysiloxane composition consisting essentially of (A) 100 parts by weight of polyorganosiloxane having at least 2 vinyl groups bonded to silicon atom(s), on the average, in the molecule, (B) 0.1 to 30 parts by weight of polyorganohydrogensiloxane having at least 2 hydrogen atoms bonded to silicon atom(s), on the average, in the molecule, with the proviso that if the polyorganosiloxane (A) has only 2 vinyl groups bonded to silicon atom(s), on the average, in the molecule, more than 2 hydrogen atoms bonded to the silicon atom(s) are present, on the average, in the molecule of (B), (C) 0.000001 to 0.1 part by weight of platinum compound effective as a catalyst for reacting said polyorganosiloxane with said polyorganohydrogensiloxane, (D) phosphorus compound having the formula:

$$PR_3$$

in which the R groups, which can be the same or different, are monovalent groups selected from the group consisting of substituted or unsubstituted, hydrocarbon groups, alkoxy groups, aryloxy groups and hydroxyl groups, the amount of said phosphorus compound being at least one equivalent to the platinum atoms in the platinum compound (C), and (E) an organic peroxide having no hydroperoxy group in the molecule, the amount of said organic peroxide being at least one equivalent to the phosphorus compound (D) and less than 0.1 part by weight, per 100 parts by weight of component (A).

4,329,276

MOLDING COMPONENTS

Joseph E. Reardon, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1981, Ser. No. 242,584

Int. Cl.³ G08K *3/04;* C08G *67/02*

U.S. Cl. 524—502 **9 Claims**

1. A molding blend component consisting essentially of

(a) about 40–85% by weight of blend of at least one acrylic polymer having a glass transition temperature of between about 45°–105° C. and an inherent viscosity between 0.1–0.6, said polymer containing units derived from

0–100% $CH_2=C(CH_3)-COOR$,

0–100% $CH_2=CH-COOR$, and

0–50% styrene,

in which the total percent of the monomer units is 100% and R is alkyl of 1–18 carbons;

(b) about 5–30% by weight of blend of a high melt index terpolymer derived from units (by weight) of 60–80% ethylene, 5–60% copolymerizable unsaturated monomer, and 3–30% carbon monoxide, said terpolymer having a melt index over 20;

(c) about 5–30% by weight of blend of a low melt index terpolymer derived from units (by weight) of 60–80% ethylene, 5–60% copolymerizable unsaturated monomer, and 3–30% carbon monoxide, said terpolymer having a melt index less than 1;

(d) about 2–20% by weight carbon black.

4,329,277

ANTIFOULING POLYURETHANES

Walter T. Murphy, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 3, 1980, Ser. No. 193,700

Int. Cl.³ C08K *5/16*

U.S. Cl. 523—122 **10 Claims**

1. A polymeric composition resistant to fouling in sea water comprising a polyurethane elastomer containing greater than 2 weight parts of tetrachloroisophthalonitrile per 100 weight parts polyurethane.

4,329,278

MOLDING COMPOSITIONS

Joseph E. Reardon, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1981, Ser. No. 242,585

Int. Cl.³ C08K *3/04;* C08G *67/02*

U.S. Cl. 524—523 **7 Claims**

1. A molding blend consisting essentially of

(a) polyvinyl chloride

(b) about 5–25% by weight of blend of at least one acrylic polymer having a glass transition temperature of between about 45°–105° C. and an inherent viscosity between 0.1–0.6, said polymer containing units derived from

0–100% $CH_2=C(CH_3)-COOR$,

0–100% $CH_2=CH-COOR$, and

0–50% styrene,

in which the total percent of the monomer units is 100% and R is alkyl of 1–18 carbons;

(c) about 1–10% by weight of blend of a high melt index terpolymer derived from units (by weight) of 60–80% ethylene, 5–60% copolymerizable unsaturated monomer, and 3–30% carbon monoxide, said terpolymer having a melt index over 20;

(d) about 1–15% by weight of blend of a low melt index terpolymer derived from units (by weight) of 60–80% ethylene, 5–60% copolymerizable unsaturated monomer, and 3–30% carbon monoxide, said terpolymer having a melt index less than 1; and

(e) about 2–20% by weight carbon black.

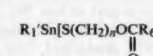
4,329,279

ORGANOSTANNIC STABILIZING COMPOSITIONS FOR VINYL HALIDE RESINS

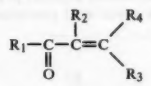
Michel Foure, Artix, France, assignor to Societe Nationale Elf Aquitaine, France

Filed May 20, 1980, Ser. No. 151,638
Claims priority, application France, May 23, 1979, 79 13109
Int. Cl.[3] C07F 7/22
U.S. Cl. 524—180 13 Claims

1. New monoorganic tris-thioalkyl tin compounds of the general formula:

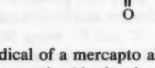


in which R′ is the radical of an olefin:



(1)

in which R_2, R_3, and R_4 represent hydrogen or an alkyl hydrocarbon radical containing from 1 to 3 carbon atoms and R_1 represents an alkyl group, a hydroxy or a hydrocarbon group containing oxygen, and the three



groups are the radical of a mercapto alkyl ester in which the mercapto group is contained in the alcohol radical of the ester, R_6 is an alkyl containing from 1 to 18 carbon atoms, n is equal to 2, 3 or 4; one of the methylenes optionally substituted by a hydroxyl group.

4. A stabilizer composition for polyvinyl halides, characterized by the fact that the composition contains at least one compound according to claim 1 or 3 in combination with a different stannic stabilizer.

4,329,280

PROCESS FOR SEPARATING ESTERS OF FATTY AND ROSIN ACIDS

Michael T. Cleary, Elmhurst; Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 10, 1981, Ser. No. 252,745
Int. Cl.[3] C11C 1/08; C09F 1/02, 1/04
U.S. Cl. 260—97.6 11 Claims

1. A process for separating an ester of a fatty acid from a mixture comprising an ester of a fatty acid and an ester of a rosin acid, said process comprising contacting said mixture at adsorption conditions with an adsorbent comprising silicalite, thereby selectively adsorbing said ester of a fatty acid thereon.

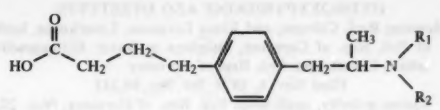
4,329,281

HAPTEN COMPOSITIONS

James G. Christenson, North Caldwell, and Benjamin Pecherer, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 912,287, Jun. 5, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 106,347
Int. Cl.[3] A61K 39/395, 39/385; C07G 7/00; G01N 33/54
U.S. Cl. 260—112 B 3 Claims

1. An antibody specific to amphetamine prepared by inoculating a host animal with an immunogen of the formula



which is covalently bonded through the carboxyl group to an immunogenic carrier material, where R_1 is hydrogen and R_2 is hydrogen, and thereafter collecting serum from said host animal.

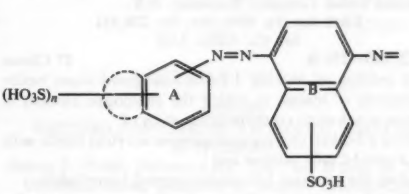
4,329,282

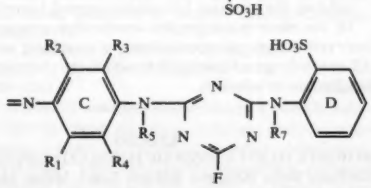
FLUORO-TRIAZINE-CONTAINING FIBRE-REACTIVE DISAZO DYESTUFFS

Hermann Henk, Cologne, Fed. Rep. of Germany, assignor to Bayer Akteingesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,078
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733109; Feb. 1, 1978, 2804248
Int. Cl.[3] C09B 43/12, 43/16
U.S. Cl. 260—153 3 Claims

1. Fibre-reactive disazo dyestuffs of the formula





wherein

R_1 to R_4 independently of one another denote hydrogen, a low-molecular alkyl group or a low-molecular alkoxy group,

R_5 denotes hydrogen or a low-molecular alkyl group n is 1, 2 or 3 and

R_7 denotes hydrogen, low-molecular alkyl, aryl, aralkyl, or cycloalkyl, and

the benzene or naphthalene ring A in addition to the sulfonic acid groups, can be substituted by C_1–C_4-alkyl, C_1–C_4 alkoxy, carboxyl, halogen, C_1–C_4-alkylcarbonylamino or benzoyl amino;

the naphthalene ring B in addition to the sulfonic acid group can be C_1–C_4-alkoxy substituted and the benzene radical D in addition to the sulfonic acid group in 2-position can be substituted by one sulfo or carboxyl group, by C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, C_1–C_4-alkylcarbonylamino or benzoylamino groups.

4,329,283

HYDROXYPYRIDONE AZO DYESTUFFS

Henning Reel, Cologne, and Klaus Leverenz, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

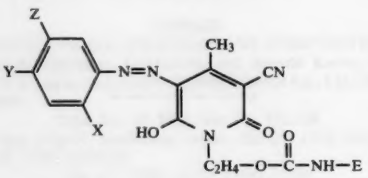
Filed Nov. 1, 1979, Ser. No. 90,212

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850643

Int. Cl.[3] C09B *31/01*

U.S. Cl. 260—156 4 Claims

1. An azo disperse dyestuff of the formula



in which

E is C_1–C_4-alkyl,

X is H, Cl or NO_2,

Y is H, Cl, Cl_1–C_4-alkyl, OCH_3 or OC_6H_5, and

Z is H or Cl,

with the proviso that when X is H or Cl both Y and Z are Cl.

4,329,284

1,2-OXACHALCOGENOL-1-IUM SALTS

Michael R. Detty; Thomas E. Goliber; Bruce J. Murray, and Jerome H. Perlstein, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 19, 1981, Ser. No. 226,341

Int. Cl.[3] G03G *5/06*

U.S. Cl. 260—239 R 17 Claims

1. A method of making 1,2-oxachalcogenol-1-ium halide compositions of matter in which the chalcogen element is tellurium or selenium comprising the steps of:

treating a 3-alkyl- or a 3-arylchalcogenoacryloyl halide with a Friedel-Crafts catalyst and

isolating the resultant 1,2-oxachalcogenol-1-ium halide.

11. An electrophotographic composition comprising a donor-type organic photoconductor, a sensitizing amount of a 1,2-oxachalcogenol-1-ium salt in which the chalcogen element is tellurium or selenium.

4,329,285

FORMYL DERIVATIVES OF HYDRAZINOPENICILLINS

Goffredo Bolis, Bergamo; Roberto Giani, Milan; Mario Pinza, Corsico; Giorgio Pifferi, and Giampietro Broccali, both of Milan, all of Italy, assignors to C R A F Sud, Rome, Italy

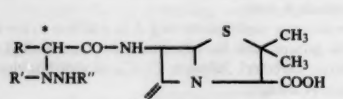
Filed Dec. 29, 1980, Ser. No. 221,365

Claims priority, application Italy, Dec. 27, 1979, 28399 A/79

Int. Cl.[3] C07D *499/68, 499/70*

U.S. Cl. 260—239.1 8 Claims

1. Formyl derivatives of hydrazinopenicillins of the formula



wherein R is thienyl or phenyl, R′ is hydrogen, formyl or alkyl containing from 1 to 3 carbon atoms and R″ is hydrogen or formyl, provided that at least one of R′ and R″ is a formyl group, the carbon atom with the asterisk indicating a center of asymmetry of the molecule, and pharmaceutically acceptable salts and esters thereof, as mixture or as separated epimers.

4,329,286

HYDROXYAMIDE ACID PRODUCTS AND BUTYROLACTONE AND BUTYROLACTAM PRODUCTS

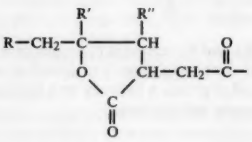
El-Ahmadi I. Heiba, Princeton, and Albert L. Williams, Hopewell Township, Mercer County, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 618,173, Sep. 30, 1975, Pat. No. 4,190,588, which is a continuation-in-part of Ser. No. 355,360, Apr. 27, 1973, Pat. No. 3,925,232, which is a continuation-in-part of Ser. No. 212,626, Dec. 27, 1971, abandoned. This application May 4, 1979, Ser. No. 36,269

Int. Cl.[3] C07D *207/27;* C10M *1/36;* C11D *9/30;* C10L *1/10*

U.S. Cl. 548—519 1 Claim

1. A lactam-amide-carbamate product prepared by reacting a gamma-butyrolactone acetic acid precursor compound having the structure



wherein each of R, R′ and R″ is a radical selected from the group consisting of hydrogen and hydrocarbon, the total carbon atom content of R, R′ and R″ being 30 to about 300 and wherein the dangling valence is attached to a member selected from the group consisting of free —OH, salts thereof, —ORa and —SRa, wherein Ra is alkyl of from 1 to about 20 carbon atoms, with an alkylene polyamine of the formula H_2N—$(C_mH_{2m}NH)_n$—H, wherein m is an integer of 2 to 4 and n is an integer of 1 to 10, said amine being added to the said lactone acid compound as the sole reactant, said reaction being conducted at an elevated temperature of from about 175° to about 275° C. for a time effective to convert said precursor lactone to bis lactam and polymers thereof, and reacting said lactam product in the presence of carbon dioxide with an alkali metal or alkaline earth metal alkoxide, phenate or alkyl-substituted phenate, the alkoxides and alkyl substituents containing from 1 to about 20 carbon atoms, thereby forming said carbamate product.

4,329,287

HALO-(CARBONYLDIOXYARYL)ETHYLENES

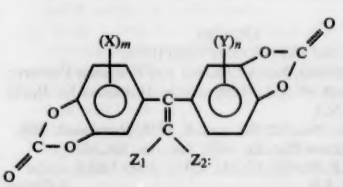
Ronald L. Markezich, Williamsville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1980, Ser. No. 212,485

Int. Cl.[3] C07D *317/46*

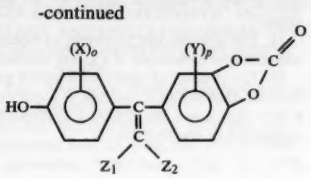
U.S. Cl. 549—241 3 Claims

1. A halo(carbonyldioxyaryl) ethylene compound selected from the class consisting of the general formulas:



and

-continued



where X and Y are members independently selected from the class consisting of halogens or C_{1-3} alkyls, m, n, o and p are a whole number equal to from 1 to 3, inclusive, Z_1 is hydrogen, chlorine or bromine and Z_2 is chlorine or bromine where the —OH group has at least a hydrogen attached to the aryl ring which is ortho positioned relative to the —OH group.

4,329,288

(1RS,4SR,5RS)-4-(5-HYDROXY-4,8-DIMETHYL-8-NONENYL)-4-METHYL-3,8-DIOXABICYCLO[3.2.1]OCTANE-1-ACETIC ACID

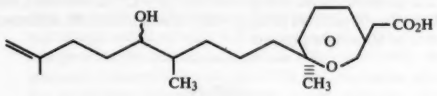
Zoltan G. Hajos, Princeton, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 146,538, May 2, 1980, Pat. No. 4,284,565. This application Dec. 29, 1980, Ser. No. 220,945

Int. Cl.³ C07D *493/08, 319/10*

U.S. Cl. 549—363 1 Claim

1. A compound of the formula



4,329,289

ADRENERGIC BLOCKING AGENTS

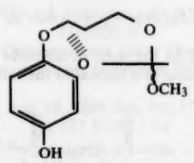
Kenneth E. Fahrenholtz, Bloomfield; Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, and Jefferson W. Tilley, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 181,257, Aug. 25, 1980, which is a division of Ser. No. 73,051, Sep. 6, 1979, Pat. No. 4,247,710, which is a division of Ser. No. 875,966, Feb. 8, 1978, Pat. No. 4,202,978. This application Jul. 29, 1981, Ser. No. 288,089

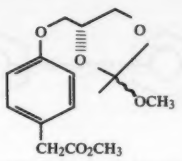
Int. Cl.³ C07D *317/10*

U.S. Cl. 549—449 2 Claims

1. The compound of the formula



2. The compound of the formula



4,329,290

ANTITHROMBOTIC DERIVATIVES OF AMMONIUM ASCORBATE

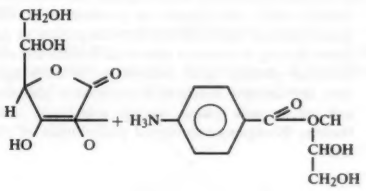
Philip N. Sawyer, 7600 Ridge Blvd., Brooklyn, N.Y. 11209, and Leon D. Freeman, 48 Alta Way, Corte Madera, Calif. 94925

Continuation-in-part of Ser. No. 35,637, May 3, 1979, abandoned, which is a continuation of Ser. No. 701,874, Jul. 1, 1976, Pat. No. 4,164,585. This application Jan. 31, 1980, Ser. No. 117,066

Int. Cl.³ C07D *307/62*

U.S. Cl. 549—316 1 Claim

1. P-carboglyceryloxy ammonium ascorbate:



4,329,291

METHOD FOR MAKING AROMATIC BIS(ETHER ANHYDRIDE)S

Jimmy L. Webb, Ballston Lake, N.Y., and Bharat M. Mehta, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,804

Int. Cl.³ C07D *307/89*

U.S. Cl. 549—241 5 Claims

1. In the process of making aromatic bis(ether phthalic anhydride) through an imide-anhydride exchange reaction, comprising heating a mixture of aromatic bis(ether phthalimide), phthalic anhydride, water and an triorganoamine exchange catalyst, whereby extended reaction periods, or venting of the reaction mixture is required, the improvement which comprises, forming the imide-anhydride reaction mixture by intermixing the aromatic bis(ether imide) while in the molten state with an aqueous mixture of phthalic acid containing 25–35% phthalic acid by weight and a triorgano amine and extracting the resulting aqueous mixture with an organic solvent.

4,329,292

CONTINUOUS METHOD FOR MAKING AROMATIC BIS(ETHER PHTHALIC ACID) OR AROMATIC BIS(ETHER ANHYDRIDE)

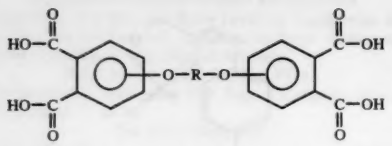
Jimmy L. Webb, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,815

Int. Cl.³ C07C *63/00;* C07D *307/89*

U.S. Cl. 549—241 15 Claims

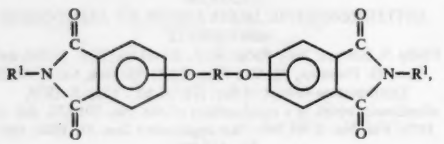
1. A continuous biphasic imide-anhydride exchange process for making aromatic bis(ether phthalic acid) of the formula:



or the anhydride thereof which comprises:

(A) passing a mixture comprising:

(i) aromatic bis(ether phthalimide of the formula:

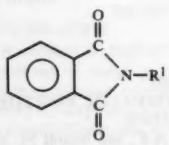


(ii) phthalic anhydride or phthalic acid

(iii) an exchange catalyst

(iv) water

(v) a water-immiscible inert organic solvent through a heated coiled tube reactor to produce an equilibrated liquid biphasic reaction mixture comprising an aqueous phase having selectively dissolved therein the aromatic bis(ether phthalic acid) formed in the exchange reaction, the catalyst, along with any excess phthalic acid, and an organic phase having selectively dissolved therein, N-organo substituted phthalimide of the formula:



which was also formed in the exchange reaction, together with any unreacted aromatic bis(ether phthalimide),

(B) separating the organic phase from the aqueous phase

(C) recovering the aromatic bis(ether phthalic acid) from the aqueous phase, and optionally dehydrating it to form the dianhydride, where R is a divalent aromatic radical having from 6–30 carbon atoms and R^1 is a monovalent organo radical selected from the class consisting of $C_{(1-8)}$ alkyl radicals, and organic radicals having from 6–20 carbon atoms selected from the class consisting of aromatic hydrocarbon radicals and halogenated derivatives thereof.

4,329,293

TRIALKYLAMINE/SULFUR DIOXIDE CATALYZED SULFENYLATION OF CARBAMATES

John W. Ager; Maurice J. C. Harding, both of Princeton, and Charles E. Hatch, III, Pennington, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 31, 1980, Ser. No. 202,526

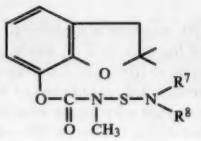
Int. Cl.³ C07D *307/86*; C07C *145/04, 195/04*

U.S. Cl. 549—470 **14 Claims**

1. In a process for sulfenylating an N-alkyl carbamate with a sulfenyl halide in a solvent in the presence of an acid acceptor, the improvement which comprises reacting said N-alkylcarbamate and a sulfenyl halide in the presence of a catalytic amount of a complex of sulfur dioxide and a trialkylamine of the formula $R^4NR^5R^6$ wherein each of R^4, R^5, and R^6 is a lower alkyl group.

12. The process improvement of claims **1**, **2**, **3**, **4**, **5**, or **6**, wherein said carbamate is a lower alkylcarbamate.

13. The process of claim **12** wherein said carbamate is carbofuran, said sulfenyl chloride is a compound of the formula R^7R^8—NSCl and the resulting aminosulfenyl carbamate is a compound of the formula



in which R^7 and R^8 are each alkyl groups of 1 to 10 carbon atoms.

4,329,294

PROCESS FOR PREPARING 17α-HYDROXY-20-KETOSTEROIDS

Charles A. McCombs, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 26, 1981, Ser. No. 247,951

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.4 **12 Claims**

1. A process for preparing 17α-hydroxy-20-ketosteroids from 20-ketosteroids which comprises oxidizing pregn-20-one with air or oxygen using a base catalyst in the presence of a tri-lower alkyl phosphite reducing agent in a suitable solvent consisting essentially of at least one polar, nonprotic component selected from the group consisting of dimethylformamide and tetrahydrofuran and at least one C_5 to C_{12} tert-alcohol, said C_5 to C_{12} tertalcohol being present in said solvent in an amount of 5 to 50 weight percent.

4,329,295

24-CYCLOPROPYLCHOLENE-3β, 22-DIOLS AND ESTERS THEREOF

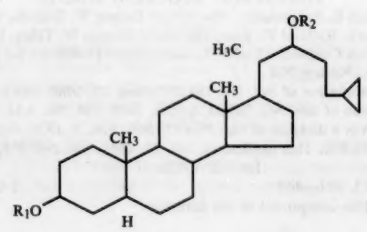
Robert J. Chorvat, Arlington Heights, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jun. 29, 1981, Ser. No. 278,276

Int. Cl.³ C07J *9/00*

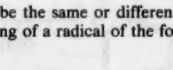
U.S. Cl. 260—397.2 **8 Claims**

1. A compound of the formula



wherein the bond between C_5 to C_6 may be saturated or unsaturated;

R_1 and R_2 may be the same or different selected from the group consisting of a radical of the formula



in which N represents an integer from 1–6 and hydrogen.

4,329,296

BRANCHED CHAIN AND CYCLOALIPHATIC ESTERS OF THE ANDROSTANE AND OESTRANE SERIES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Lambert J. W. M. Tax, Macharen, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 852,326, Nov. 17, 1977, Pat. No. 4,212,864. This application Feb. 12, 1980, Ser. No. 120,608

Claims priority, application Netherlands, Nov. 26, 1976, 7613248

The portion of the term of this patent subsequent to Jul. 15, 1997, has been disclaimed.

Int. Cl.[3] A61K *31/56;* C07J *1/00*

U.S. Cl. 260—397.4 4 Claims

1. The compound 4-chloro-17β-hydroxy-Δ^4-androsten-3-one 17β-3'-cyclohexylbutyrate.

4,329,297

PROCESS FOR PREPARING SATURATED ω-AMINO ACIDS

Pietro P. Rossi, Garlasco, and Mario De Gaetano, Cesano Maderno, both of Italy, assignors to SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Mar. 18, 1980, Ser. No. 131,106

Claims priority, application Italy, Mar. 21, 1979, 21163 A/79

Int. Cl.[3] C11C *1/00*

U.S. Cl. 260—404 19 Claims

1. A process for preparing, continuously or in batches an omega-amino acid of the general formula (I) $H_2N—(CH_2—)_{n+1}COOH$, wherein "n" is an integer from 4 to 16, in a high yield of 90% or more with very few by-products, comprising:

(1) iminating an unsaturated omega-aldehyde acid to produce an imine of said omega-aldehyde acid, said imine of said omega-aldehyde acid being prepared by adding said omega-aldehyde acid to an ammonia solution wherein the ammonia concentration exceeds 10% and, thereafter adding an alkaline hydroxide solution to said ammonia solution, said imination being carried out at room temperature or below;

(2) catalytically reducing in a single hydrogenation step said imine of said omega-aldehyde acid in the presence of ammonia and an alkaline metal hydroxide thereby forming a alkaline salt of said imine of the omega-aldehyde acid, which is subsequently reduced to the corresponding alkaline salt of the omega-amino acid, wherein said reductive imination is carried out under pressure of from 20 to 70 Ate in the presence of a nickel catalyst and, wherein said reduction is carried out in two steps at two different temperature ranges, the first step at a temperature of from 100° to 150° C. and the second step at a temperature of from 150° to 180° C.

(3) acidifying the thus obtained alkaline salt of the omega-amino acid thereby producing said omega-amino acid.

4,329,298

ISOMERIZATION OF JOJOBA OIL AND PRODUCTS THEREOF

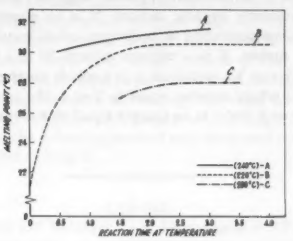
James H. Brown, Chappaqua, and Harry Olenberg, Bronx, both of N.Y., assignors to Jojoba Growers & Processors Inc., New York, N.Y.

Filed Aug. 15, 1980, Ser. No. 177,971

Int. Cl.[3] C11C *3/14*

U.S. Cl. 260—405.6 18 Claims

1. A process for the preparation of isomerates of jojoba oil having a melting point above about 25° C. which comprises the steps of contacting and reaching jojoba oil with an acidic-bentonite-type clay at temperatures in the range 150°–350° C. for



a time sufficient to provide an isomerate having a melting point in the range 25° to at least about 44° C.

4,329,299

COMPOSITION OF MATTER CONTAINING PLATINUM

Paul C. Hydes, Reading, England, assignor to Johnson, Matthey & Co., Limited, London, England

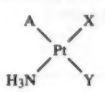
Filed Aug. 20, 1980, Ser. No. 179,786

Claims priority, application United Kingdom, Aug. 23, 1979, 7929442

Int. Cl.[3] C07F *15/00*

U.S. Cl. 260—429 R 2 Claims

1. A composition of matter comprising a cis co-ordination compound of platinum (II) having the structure



in which A is an amine having the formula R-NH_2 where R is branched chain alkyl, X and Y are the same or different halogen.

4,329,300

METHOD FOR MAKING DIARYLIODONIUM POLYHALOMETALLOID SALTS

James V. Crivello, Clifton Park, and Julia H. Lam, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,725

Int. Cl.[3] C07F *9/68, 9/92, 9/06*

U.S. Cl. 260—440 5 Claims

1. In the method for making diaryliodonium salts of the formula,

$$[(R)_a(R^1)_bI]^+[MX_c]^-,$$

based on a metathesis between a diaryliodonium bisulfate salt of the formula,

$$[(R)_a(R^1)_bI^+HSO_4^-,$$

and a polyhalometalloid salt of the formula,

$$YMX_c$$

whereby a stoichiometric excess of the polyhalometalloid salt is required to provide quantitative yields of the diaryliodonium salts, the improvement which comprises, effecting the metathesis reaction between substantially equal molar amounts of the polyhalometalloid salt and a diaryliodonium perchlorate salt of the formula,

$[(R)_a(R^1)_bI]ClO_4^-$,

to achieve quantitative yields of the diaryliodonium salts, where R is a monovalent aromatic organic radical, R^1 is a divalent aromatic organic radical, Y is an element selected from the class consisting of hydrogen, alkali metals and alkaline earth metals, X is a halogen radical, M is a Group IIIb metal or Group Va metalloid, a is a whole number equal to 0 or 2, b is a whole number equal to 0 or 1, the sum of a+b is equal to 1 or 2 and c is an integer equal to 4–6 inclusive.

4,329,301

METHOD OF PREPARING DI-ORGANO-MAGNESIUM COMPOUNDS

Borislav Bogdanovic, Mulheim an der Ruhr, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Feb. 21, 1980, Ser. No. 123,157

Claims priority, application Austria, Feb. 20, 1979, 1314/79

Int. Cl.³ C07F *3/02*

U.S. Cl. 260—665 R **20 Claims**

1. A method of preparing a di-organo-magnesium compound of the formula R_2Mg in which R is an organic radical bonded to Mg by carbon, comprising reacting magnesium hydride MgH_2 or magnesium and hydrogen with an olefin in the presence of a catalyst comprising a compound of a transition metal of the 4th to 8th secondary groups and an organometallic compound or a hydride of a metal of the 1st to 3rd principal groups of the periodic system.

4,329,302

SYNTHETIC PHOSPHOGLYCERIDES POSSESSING PLATELET ACTIVATING PROPERTIES

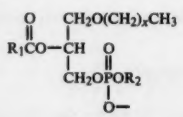
Donald J. Hanahan, and R. Neal Pinckard, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jun. 27, 1980, Ser. No. 163,808

Int. Cl.³ C07F *9/08*

U.S. Cl. 260—925 **4 Claims**

1. A substantially pure glyceryl ether phospholipid compound represented by the formula:

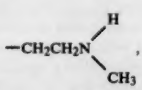


wherein

x denotes the integer 15 or 17:

R_1 is an alkyl selected from the group consisting of methyl, ethyl, and n-propyl; and

R_2 is an amine selected from the group consisting of $-CH_2CH_2{}^+N(CH_3)_2$, $-CH_2CH_2N(CH_3)_2$,



$-CH_2CH_2NH_2$ and pharmaceutically acceptable salts thereof.

4,329,303

PROCESS FOR THE PREPARATION OF 1-OXO-PHOSPHOLANE-CHLORO-HYDRINS

Utz-Hellmuth Felcht, Bruchmühlbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 167,014

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927916

Int. Cl.³ C07F *9/32, 9/53*

U.S. Cl. 260—986 **9 Claims**

1. A process for the preparation of a 1-oxo-phospholane-chlorohydrin, which comprises reacting water, a 1-oxo-phospholene, chlorine and a base which bonds hydrogen chloride, the amounts of said phospholene, chlorine and base being a molar ratio of about 1:1:1.

4,329,304

PROCESS FOR THE PREPARATION OF FINELY DIVIDED THERMOPLASTIC RESIN

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers & Chemical Corp., New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,831

Int. Cl.³ B01J *2/06*

U.S. Cl. 264—8 **6 Claims**

1. A process for preparing in finely divided form a solid organic polymeric thermoplastic resin which comprises:

(a) agitating a mixture of the resin while in the molten stage, a dispersion-forming amount of water, and a dispersion forming amount of a substantially water soluble salt of an interpolymer of (i) at least one ethylenically unsaturated ester derived from an alpha-beta-ethylenically unsaturated carboxylic acid and a lower alkanol and (ii) at least one alpha, beta-ethylenically unsaturated carboxylic acid as dispersing agent to provide a hot aqueous dispersion of the resin;

(b) cooling the dispersion to provide solid particles of resin; and,

(c) recovering said solid particles of resin from the aqueous dispersion to provide said solid polymeric thermoplastic resin in finely divided form.

4,329,305

PROCESS FOR REGULATING THE PARTICLE SIZE DISTRIBUTION OF SELF-DISPERSING IONICALLY CROSSLINKED THERMOPLASTIC POLYMER

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers & Chemical Corp., New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,837

Int. Cl.³ B01J *2/06*

U.S. Cl. 264—8 **8 Claims**

1. A process for preparing in finely-divided form an ionomer polymer of controlled particle size distribution which comprises:

(a) agitating a mixture of the polymer while in the molten state and a dispersion-forming amount of water in the presence of a particle size distribution regulating amount of acid or base to provide a hot aqueous dispersion of the polymer;

(b) cooling the dispersion to provide solid particles of polymer; and

(c) recovering said solid particles of polymer from the aqueous dispersion to provide said ionomer polymer in finely divided form.

4,329,306
HEAT CURABLE PROCESSABLE EPOXY COMPOSITIONS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 67,027, Aug. 16, 1979, Pat. No. 4,283,312, which is a continuation-in-part of Ser. No. 861,128, Dec. 16, 1977, which is a continuation-in-part of Ser. No. 781,785, Mar. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 689,247, May 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 638,982, Dec. 9, 1975, Pat. No. 4,058,401, which is a continuation-in-part of Ser. No. 638,994, Dec. 9, 1975, Pat. No. 4,069,055. This application May 22, 1980, Ser. No. 152,424

The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.

Int. Cl.³ B29D *23/00*; B29C *27/26*

U.S. Cl. 264—137 **2 Claims**

1. A filament winding method for making a reinforced composite structure which comprises

(1) passing glass fibers through a bath of a curable epoxy resin,

(2) winding the resulting treated fibers onto a mandril,

(3) heating the resulting wound fibers until the resin is cured,

(4) separating the mandril from the resulting composite structure, where the curable epoxy resin is a composition comprising

(A) an epoxy resin having a viscosity of from about 100 to 100,000 centipoises at 25° C.

(B) an effective amount of aromatic iodonium salt of the formula,

$$[(R)_a(R^1)_bI]_c^+[MQ_d]^{-(d-e)}, \text{ and}$$

(C an effective amount of a copper salt, where R is a monovalent aromatic organic radical, R^1 is a divalent aromatic organic radical, M is a metal or metalloid, Q is a halogen radical, a is a whole number equal to 0 or 2, b is a whole number equal to 0 or 1 and the sum of a+b is equal to 1 or 2, c=d-e, e equals the valence of M and is an integer equal to 2–7 inclusive and d>e and is an integer having a value up to 8.

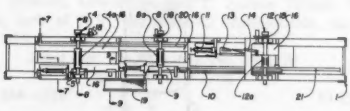
4,329,307
METHOD FOR FORMING PLASTIC SHEET

Robert F. Westcott, Norwalk, and John R. Delamater, Berlin Heights, both of Ohio, assignors to American Hoechst Corporation, Leominster, Mass.

Filed Mar. 31, 1980, Ser. No. 135,848

Int. Cl.³ B29C *7/14*

U.S. Cl. 264—160 **5 Claims**



1. A method for continuously forming plastic sheet to a desired cross-section comprising: feeding a plastic sheet to a first heating station and selectively heating and softening a first edge portion of said sheet; advancing said sheet to a first forming station having a first transition guide wherein said heated first edge portion is brought into contact with the first transition guide; advancing said sheet through said first transition guide wherein said heated first edge portion is rotated through a plane transverse to the surface of the unheated portion of the sheet to impart a desired configuration in said first edge portion; advancing said sheet to a first cooling station wherein said heated first portion is cooled below the softening point of said sheet; advancing said sheet to a second heating station and selectively heating and softening a second edge portion of said sheet located on the opposite side of said sheet from said first edge portion; advancing said sheet to a second forming station having a second transition guide wherein said heated second edge portion is brought into contact with a second transition guide; advancing said sheet through said second transition guide wherein said heated second edge portion is rotated through a plane transverse to the surface of the unheated portion of the sheet to impart a second desired configuration in said second edge portion; advancing said sheet to a second cooling station wherein said heated second edge portion is cooled below the softening point of said sheet; and cutting said sheet to a desired length.

4,329,308
METHOD OF MAKING AN ABRADABLE STATOR JOINT FOR AN AXIAL TURBOMACHINE

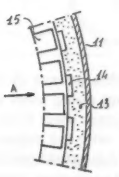
Herbert Langer, Dammarie les Lys, and Gerald Saiveau, St. Germain les Corbeil, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Division of Ser. No. 762,344, Jan. 25, 1977, abandoned. This application Aug. 2, 1979, Ser. No. 62,988

Claims priority, application France, Jan. 30, 1976, 76 03140

Int. Cl.³ B29C *17/00*

U.S. Cl. 264—162 **2 Claims**



1. A method of making an abradable sealing stator joint for a stage of an axial turbomachine having a bladed rotor, said stator having a cylindrical collar defining a track bordered by two rims, said joint consisting of a cylindrical ribbon made of a material with a polymeric resin base in said track between said rims, said method including the steps of:

stamping recesses in the ribbon, while uncured, by means of a serrated wheel action thereby simultaneously compressing the ribbon into the track;

polymerizing the ribbon to cause the same to adhere to said track; and

machining the internal wall of the polymerized joint in order to eliminate the extra thickness and burs left by the serrated wheel action.

4,329,309
PRODUCING RETICULATED THERMOPLASTIC RUBBER PRODUCTS

William G. F. Kelly, Middlesex, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 67,850, Aug. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 36,726, May 5, 1979, Pat. No. 4,305,990, which is a division of Ser. No. 848,439, Nov. 3, 1977, Pat. No. 4,173,612. This application Aug. 19, 1980, Ser. No. 179,593

Int. Cl.³ B29D *7/14*

U.S. Cl. 264—167 **9 Claims**

1. Process for producing reticulated thermoplastic rubber sheet material which comprises:

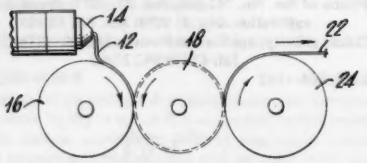
(a) extruding a thin molten sheet consisting essentially of a mixture of

(i) thermoplastic rubber comprising a block copolymer of styrene and butadiene or isoprene, and

(ii) sufficient olefin polymer to improve the processability of said thermoplastic rubber, as evidenced by the ability

to achieve a draw ratio of greater than 1 while extruding said mixture, said olefin polymer being selected from the group consisting of isotactic polypropylene, polyethylene, amorphous polypropylene, polybutylene, ethylene/vinyl acetate copolymer, ethylene/ethyl acrylate copolymer, ethylene/methyl acrylate copolymer, and polystyrene;

(b) feeding the extruded molten sheet directly to the surface of a smooth surfaced first roll at a first position on said surface, wherein said first roll is rotating at a first peripheral linear speed, wherein said first roll is in contact with a second roll at a second position on said surface disposed from said first position to form a nip between said first and second rolls, the second roll havings its longitudinal axis essentially parallel to the longitudinal axis of the first roll, wherein said second roll is rotating in a direction opposite to said first roll at a second peripheral linear speed equal to, slightly greater, of slightly less than said first peripheral linear speed, and wherein said second roll has a resil-



ient surface with a pattern of continuous recessed areas and discontinuous raised areas disposed over its surface;

(c) passing said molten sheet from said first position to said second position, with the surface temperature of said first roll being such that said sheet is in a formable state when it arrives at said second position;

(d) passing said sheet through the nip between said first and second rolls, wherein the pressure at said nip is sufficient to penetrate said sheet and form said sheet into an open reticulated sheet of intersecting filaments corresponding in structure to said pattern of recessed areas on the surface of said second roll;

(e) passing said open reticulated sheet around the surface of said second roll to a third position on the surface of said second roll disposed from said nip, wherein the surface of said second roll is maintained at a temperature such that said reticulated sheet is a solid, self-supporting structure when it arrives at said third position; and

(f) removing said reticulated sheet from said second roll at said third position.

4,329,310

METHOD OF EXTRUDING DISCRETE PHASE ELASTOMER CONTAINING THERMOPLASTIC POLYMERS

Michael J. Turczyk, Yonkers, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 5, 1977, Ser. No. 756,950

Int. Cl.³ D01F *1/10, 6/04, 6/16, 6/28*

U.S. Cl. 264—211 **6 Claims**

1. In an extrusion process for a discrete phase, elastomer-containing thermoplastic polymer comprising crosslinked acrylate or methacrylate, crosslinked styrene-acrylonitrile and uncrosslinked styrene-acrylonitrile polymeric components to form products by extrusion in an extrusion apparatus wherein the improvement comprises using an effective amount for extrusion lubrication of a lubricant selected from the group consisting of polyethylene and poly(ethylene/vinyl acetate) having molecular weights of from about 100,000 to about 1,000,000 to produce products with a high surface gloss.

4,329,311

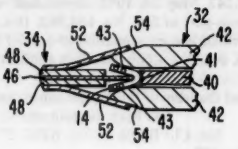
METHOD AND APPARATUS FOR FOLDING AND FORMING TRAINS OF SLIDE FASTENER ELEMENTS

George B. Moertel, Conneautville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed Sep. 29, 1980, Ser. No. 191,597

Int. Cl.³ B29D *5/00*

U.S. Cl. 264—285 **9 Claims**



1. A method of folding and forming a continuous train of flat slide fastener coupling element bodies into a train of slide fastener coupling elements, the method comprising the steps of

rotating a forming disc;

feeding the flat element bodies of the train of flat coupling element bodies in a heated condition to the periphery of the rotating forming disc;

folding leg portions of the element bodies onto opposite sides of the forming disc;

engaging a pair of flexible discs with the folded leg portions on the opposite sides of the forming disc;

maintaining the engagement of the discs with the folded leg portions for a portion of the forming disc rotation to form the train of slide fastener coupling elements; and

removing the train of slide fastener coupling elements from the forming disc.

4,329,312

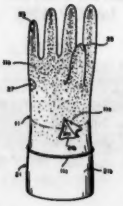
METHOD OF MAKING GLOVES

Rudolph V. Ganz, Canton, Ohio, assignor to Affiliated Hospital Products, Inc., St. Louis, Mo.

Continuation of Ser. No. 447,581, Mar. 4, 1974, abandoned, Ser. No. 292,492, Sep. 27, 1972, abandoned, Ser. No. 154,641, Jun. 18, 1971, abandoned, and Ser. No. 876,812, Nov. 14, 1969, abandoned. This application Oct. 10, 1975, Ser. No. 621,610

Int. Cl.³ B29H *3/04*

U.S. Cl. 264—306 **24 Claims**



1. The method of forming a roughened surface glove comprising dip-forming and partially air-drying a coating of aqueous solution of rubber latex while in contiguous film-covering relation on a desired use portion of a hand-shaped glove form having fingers and a thumb, to form an uncured film of rubber latex on said form with an inner surface having a mirror image of the film-covered portion of the outer surface of the form,

externally spraying an aqueous liquid latex solution in droplet form onto the outer surface of said film in the palm, finger and thumb-gripping zones formed thereby, and while said film is in an uncured condition, to thereby form a rough external surface on said film,

and curing and removing the resulting latex-droplet-

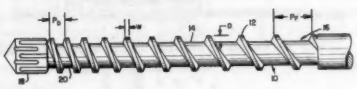
impacted glove film including the impacted latex droplet solution thereon, from said form,

said external spraying being effected by simultaneously directing a spray of said liquid latex soltuion from two sources and in two intersecting path directions of latex spray toward the palm side of said form while effecting relative motion between said form and said spray sources to effect relative effective rectilinear movement of said form along a path extending toward, in front of and laterally past and away from said two spray sources of liquid latex solution while thereby varying the effective zones of intersection and angles of intersection of the spray from said two sources with said uncured film as a function of said rectilinear motion of said form toward, past and away from said spray.

4,329,313
APPARATUS AND METHOD FOR EXTRUDING ETHYLENE POLYMERS

John C. Miller, Piscataway, and Archibald L. Burnett, Warren, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 12, 1980, Ser. No. 206,146
Int. Cl.³ B29F *3/06*
U.S. Cl. 264—349 **18 Claims**



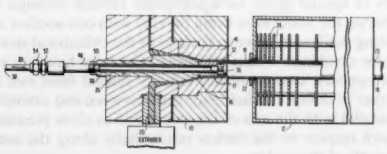
1. A method for extruding low density narrow molecular weight distribution, linear, ethylene polymers which comprises passing said polymers through an extruder apparatus including an extruder screw having a flight and having an inlet end and a discharge end and wherein the pitch ratio divided by the depth ratio is greater than $\frac{3}{4}$.

11. A novel extruder screw for extruding polymers which comprises a screw root with at least one flight having an entry end and a discharge end, said screw being divided into at least three segments wherein the pitch remains constant within each segment and changes abruptly from one segment to the following segment and wherein the pitch ratio divided by the depth ratio is greater than $\frac{3}{4}$.

4,329,314
METHOD AND APPARATUS FOR INSIDE FROSTING OF TUBING

Isaac S. Jackson, Greenwich, and L. Nelson Tilford, North Argyle, both of N.Y., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Oct. 31, 1980, Ser. No. 202,870
Int. Cl.³ B29F *3/08*
U.S. Cl. 264—519 **11 Claims**



1. In an extrusion die assembly for a plastic tube which includes an inner die pin and an outer die bushing and a passage therebetween through which plastic is extruded for forming the tube, means for providing inside frosting of the tube comprising:

(a) a passage extending through said inner die pin;

(b) a conduit positioned in said passage and extending through said inner die pin;

(c) said conduit being connectible to a source of air under pressure;

(d) at least the tip portion of said inner die pin being formed of a material having good heat conductivity; and

(e) means at the inner end of said conduit for directing air uniformly against the inner surface of said tip portion for cooling said inner die pin to produce frosting of the inner surface of the tube;

(f) the tube being open to the atmosphere so that air supplied through said conduit may be discharged through the open end of the tube.

9. A method for frosting the inside surface of a tube simultaneously with the extrusion of the tube comprising:

(a) providing an inner die pin at least the tip portion of which is formed of a material of good heat conductivity;

(b) supplying air under pressure through a conduit extending to a point near the tip of said inner die pin;

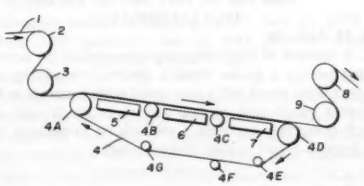
(c) directing the air uniformly against the inner surface of the tip portion of said inner die pin for cooling said inner die pin to induce frosting of the tube being extruded over said inner die pin; and

(d) leaving the end of the tube open to allow escape of air therethrough.

4,329,315
SHEET STRESS RELAXATION

Van P. Brower, Wilbraham, and Harold H. Hopfe, Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 24, 1980, Ser. No. 200,238
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—555 **5 Claims**



1. A process for the production of a relaxed thermoplastic polymer sheet which comprises:

A. delivering a thermally stressed thermoplastic polymer sheet preheated to a temperature at which the sheet can relax the thermal stresses to a moving perforated conveyor;

B. providing a vacuum plenum beneath a first portion of the conveyor such that the polymer sheet is initially held in contact with the conveyor;

C. providing a source of heated gas under pressure beneath a second portion of the conveyor such that the sheet, as it moves from the region of the vacuum plenum, is supported on air supplied from said source and is thereby maintained at a stress relaxation temperature and relaxed as it is forwarded; and

D. forwarding and collecting the relaxed sheet at such a temperature and take up rate that no further stresses are imparted to the sheet.

4,329,316
INSTRUMENT FOR CHEMI- OR BIOLUMINESCENT ANALYSIS

Wladimir Wladimiroff, Kyrkbacken 27, Solna S-17150, and Gabor Merenyi, Bjornstigen 28, Solna S-17172, both of Sweden

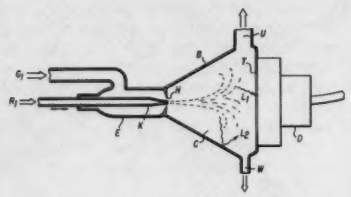
PCT No. PCT/SE79/00136, § 371 Date Feb. 13, 1980, § 102(e) Date Feb. 13, 1980, PCT Pub. No. WO80/00098, PCT Pub. Date Jan. 24, 1980

PCT Filed Jun. 15, 1979, Ser. No. 190,673

Claims priority, application Sweden, Jun. 19, 1978, 7806999

Int. Cl.³ G01N *21/26, 21/52;* **G01J** *1/54;* **B01F** *5/18*

U.S. Cl. 422—52 **18 Claims**



1. An apparatus for luminescent analysis of the concentration of a constituent in a sample gas, comprising:

a reaction chamber;

means for ejecting into said chamber a quantity of liquid reagent in the form of aerosol liquid particles;

means for providing a flow of sample gas into said chamber at least at atmospheric pressure;

means for detecting luminescent light produced by reaction of said sample gas with said aerosol liquid particles; and

means for collecting used liquid reagent.

4,329,317
METHOD OF STABILIZING A SPECIMEN SLIDE FOR OCCULT BLOOD TESTING

Michael B. Detweiler, San Jose; Paul J. Lawrence, Campbell, and Charles W. Townsley, San Jose, all of Calif., assignors to Smithkline Instruments, Inc., Sunnyvale, Calif.

Filed Jan. 29, 1981, Ser. No. 229,430

Int. Cl.³ G01N *33/72*

U.S. Cl. 422—58 **6 Claims**

1. A method of stabilizing a specimen slide for occult blood testing having a guaiac treated specimen receiving sheet between a front panel and a rear panel with openings in the front and rear panels and pivotal covers to cover said openings which comprises applying a solution or suspension of 2,6-ditert-butyl-p-cresol to said pivotal covers.

4,329,318
CAPSULES FOR DETERMINING THE ALCOHOL CONTENT OF THE BREATH

André Le Grouyellec, Le Vialgoët, 56390 Brandivy, and Jacques Ponsy, Kerbois, 56400 Auray, both of France

Filed Sep. 13, 1979, Ser. No. 75,276

Claims priority, application France, Sep. 14, 1978, 78 26879

Int. Cl.³ G01N *1/22, 1/48*

U.S. Cl. 422—59 **9 Claims**

1. A self contained test capsule of the alcohol test type containing a solid reagent, fluid flow regulating means, the capsule being capable of being passed through by a gaseous fluid or liquid distributed by said regulating means in a predetermined quantity for reacting with the said reagent, the capsule having in its middle part an almost cylindrical portion, one end of said capsule having an orifice in communication with the almost cylindrical portion by a surface forming a seating for a fluid flow regulating element, the surface of the said seating having ribs for ensuring a centering of the regulating element at a position on the axis of the capsule, said seating positioning said regulating element to ensure a distribution of the fluid entering through the orifice into the reagent.

4,329,319
APPARATUS FOR EXTRACTING PULVEROUS OR GRANULAR MATERIAL

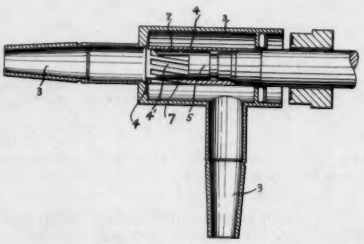
Hans-Günter Sittardt, Aachen, and Matthias Radke, Jülich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 937,416, Aug. 28, 1978, abandoned. This application May 27, 1980, Ser. No. 153,414

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 2738739

Int. Cl.³ B01D *11/02;* **B01F** *7/00, 15/02*

U.S. Cl. 422—224 **2 Claims**



1. An apparatus specifically for forming a mixture consisting of a dispersion of pulverized mineral rock and copper powder in a solvent in order to extract sulfur from the pulverized mineral rock, the apparatus comprising:

a receptacle of a relatively large diameter for containing pulverized rock sulfur powder and a solvent, said receptacle having an openable top for filling the container with the mixture and an opening in the bottom for removing the mixture from the receptacle;

a vertically extending conduit connected to the opening in the bottom of the receptacle;

a horizontal extension on the vertical conduit;

a valve aligned with and connected to the conduit at a location beneath the horizontal extension for draining the apparatus of the mixture:

an agitator connected to the horizontal conduit, the agitator comprising: a single, cylindrical sleeve having an inlet registered axially with the horizontal conduit and a plurality of spaced outlet slots positioned radially through the sleeve, the outlet slots being parallel with one another and being inclined relative to the axis of the cylindrical sleeve;

a rotor combined within the sleeve, the rotor having a pair of opposed straight blades radially spaced from one another to define a radial space therebetween and extending parallel with the axis of the sleeve and in close proximity with respect to the outlets substantially along the entire length of the outlets;

a motor for rotating the rotor at a speed of approximately 20,000 rpm in a direction which advances the blades along the slots;

a tube surrounding the sleeve in coaxial relation with respect thereto and communicating with only the outlets of the sleeve for receiving the mixture pulled through the inlet of

the sleeve and ejected through the outlets of the sleeve by rotation of the blades; and

a return conduit extending vertically upward and normal with respect to the extent of the tube for receiving the mixture from the tube, said return conduit having a horizontal section extending over the receptacle and a vertical outlet extending through the receptacle cover for returning the mixture to the receptacle for recycling, whereby the sulfur is bonded to the copper powder for subsequent removal from the pulverized rock after being drained from the apparatus.

2. Apparatus for extracting pulverous and granular material from a mixture by means of a solvent brought into contact with the mixture, the apparatus comprising:

a container having an upper and lower end for receiving the material and the solvent to be brought into contact therewith;

a duct system leading from the lower end of the container and emptying into the upper end of the container;

a pump disposed in the duct system, the pump comprising an axially extending outer chamber having an axially opening inlet connected to the duct and a radially opening outlet connected to the duct; a cylindrical housing surrounded by the chamber, the cylindrical housing having an axially opening inlet aligned with and connected to the duct and a plurality of radial slots axially extending therein, the slots being inclined with respect to the axis of the housing and opening into the chamber;

a rotary member with blades extending axially therefrom combined completely within the housing, the blades being radially spaced from one another and defining a radial space therebetween, the blades and slots having relative inclination with respect to one another in the axial direction, and

means for rotating the rotary member of high speed whereby the solid material is whirled to a sufficient extent to expose free surfaces on the solid material to the solvent while being pumped through the duct system.

4,329,320

METHOD AND TREATMENT OF A GASEOUS MIXTURE OF AMMONIA, CARBON DIOXIDE AND WATER VAPOR

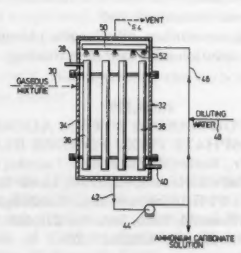
Charles Vydra, Fort Saskatchewan, and Bhupendra M. Parekh, Sherwood Park, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Continuation-in-part of Ser. No. 663,039, Mar. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 479,931, Jun. 17, 1974, abandoned. This application Dec. 22, 1977, Ser. No. 863,635

Claims priority, application Canada, Mar. 29, 1974, 196406

Int. Cl.³ C01G *1/00;* C01B *31/24;* C01C *1/26*

U.S. Cl. 423—1 **2 Claims**



1. A method of treating ammoniacal ammonium carbonate solution containing dissolved metal values, comprising heating said solution to precipitate an insoluble compound of said metal and drive off a gaseous mixture comprising ammonia gas, carbon dioxide gas and water vapour, passing the gaseous mixture into a condenser having a condensing surface therein, cooling the condensing surface to cause the gaseous mixture to condense on said surface to form ammonium carbonate solution at a temperature at which formation of solid ammonium carbamate may occur, discharging onto the condensing surface a liquid having an ammonia concentration below about 260 grams per liter to maintain the concentration of ammonia and carbon dioxide on said condensing surface below a concentration at which ammonium carbamate tends to form, recovering the condensed ammonium carbonate solution from the condenser and recovering said insoluble compound of said metal from said heating step, said liquid discharged onto the condensing surface comprising ammonium carbonate solution recovered from the condenser.

4,329,321

METHOD FOR THE RECOVERY OF SALTS OF GROUP VIII NOBLE METALS FROM SOLUTIONS

Augustine I. Dalton, Jr., and Ronald W. Skinner, both of Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 10, 1980, Ser. No. 195,972

Int. Cl.³ C01G *55/00*

U.S. Cl. 423—22 **10 Claims**

1. A process for the recovery of a salt of a Group VIII noble metal from a dilute acidic solution of pH less than 4 containing less than about 0.5% of the salt, consisting of the steps of:

(a) adding to the dilute solution up to about 10% by weight of hydrogen peroxide,

(b) contacting the resulting peroxide-containing solution with activated carbon and adsorbing on the activated carbon the salt of the Group VIII metal, and

(c) separating activated carbon on which is adsorbed Group VIII noble metal salt from a product solution containing a lower concentration of Group VIII metal salt than the dilute solution of step (a).

4,329,322

CHLORINATION OF TITANIFEROUS MATERIAL USING TREATED COAL FOR VANADIUM REMOVAL

James P. Bonsack, Aberdeen, and Fred Schneider, Jr., Baltimore, both of Md., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 95,457, Nov. 19, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 227,631

Int. Cl.³ C01G *23/02*

U.S. Cl. 423—74 **6 Claims**

1. A process for chlorinating a vanadium-containing titaniferous material in the presence of carbon to produce $TiCl_4$, which comprises selectively reacting vanadium values in vanadium-containing titaniferous materials to a valence no greater than +3 to facilitate their separation from $TiCl_4$ by

(a) fluidizing particulate vanadium-containing titaniferous material and a particulate porous carbon reductant derived from anthracite coal, said porous carbon being characterized in that said porous carbon has an internal surface area of at least about 100 m^2/g. of which at least about 10 m^2/g. of such internal surface area is in micropores having a pore diameter of less than about 20 Angstroms,

(b) contacting said fluidized particulate materials with a chlorine providing gas at a temperature of at least about 800° C. until the titanium and vanadium contents of said titaniferous material are substantially chlorinated and the vanadium is substantially entirely at a valence no greater than +3,

(c) cooling said chlorinated titanium and vanadium contents in the reaction medium to a temperature less than about 450° C. to produce first and second separable phases, the first of said phases containing substantially all of the trivalent or less vanadium values as a chlorine-containing derivative, and a second of said phases containing $TiCl_4$; and

(d) physically separating said first and second phases

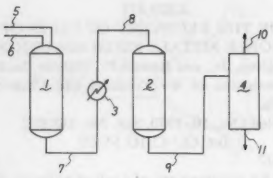
whereby the vanadium level in the $TiCl_4$ product is less than about 10 parts per million.

4,329,323

PROCESS FOR REMOVING ETHYLENE AND VINYL CHLORIDE FROM GAS STREAM

Ken Shiozaki, Hyogo, and Hironobu Ibaraki, Akashi, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 21, 1980, Ser. No. 199,301
Claims priority, application Japan, Oct. 31, 1979, 54/141616
Int. Cl.³ B01D *53/36*
U.S. Cl. 423—240 5 Claims



1. A process for removing ethylene and vinyl chloride from a gas stream which comprises passing a mixed gas comprising ethylene, vinyl chloride and up to 15 mol% of excess chlorine, based on the total amount of ethylene and vinyl chloride, through a fixed bed reactor at a temperature of 80° to 200° C., at a space velocity of 100 to 5,000 hr^{-1} and under a pressure of 1 to 20 atm.; said fixed bed reactor charged with a catalyst consisting essentially of an activated alumina supporting at least 4% by weight of ferric chloride in terms of iron, said catalyst having an outer surface area per unit packed catalyst volume of not less than 7.8 cm^2/ml., said mixed gas passing into the fixed bed reactor having a total concentration of ethylene and vinyl chloride of less than about 1% by volume and said mixed gas leaving the fixed bed reactor having an ethylene concentration of not more than 10 ppm and a vinyl chloride concentration of not more than 20 ppm.

4,329,324

METHOD OF BURNING SULFUR-CONTAINING FUELS IN A FLUIDIZED BED BOILER

Brian C. Jones, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 29, 1979, Ser. No. 88,997
Int. Cl.³ C01B *17/00*; B01J *8/00*
U.S. Cl. 423—244 8 Claims

1. In a method of burning a sulfur-containing coal, of the type wherein the sulfur-containing coal is fed to a fluidized bed of particulate material containing sulfur oxide sorbent and burned therein in close association with the sulfur oxide sorbent; and wherein particulate matter, including spent sulfur oxide sorbent, is periodically or continuously drained from the bed, the improvement comprising:

a. comminuting the particulate matter drained from the bed to a smaller particle size, thereby fracturing the spent sulfur oxide sorbent included therein so as to expose unreacted sulfur oxide absorbing surface;

b. mixing the comminuted particulate matter, including the fractured particles of spent sulfur oxide sorbent having newly-exposed unreacted sulfur oxide sorption surface, with the sulfur-containing coal being fed to the fluidized bed, thereby establishing intimate contact between the sulfur-containing coal and the newly-exposed sulfur oxide sorption surface;

c. heating said mixture of comminuted particulate matter with the sulfur-containing coal so as to effect the agglomeration of the coal in said mixture thereby fusing the comminuted particulate matter in intimate contact with the sulfur-containing coal; and

d. injecting said fused mixture of comminuted particulate matter and sulfur-containing fuel into the bed.

4,329,325

CYANURIC CHLORIDE MIXTURES AND PROCESS FOR PRODUCING SAME

Heinz-Rudiger Vollbrecht, Stein, and Fritz Wagner, Munchsmunster, both of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,021
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1978, 2839384
Int. Cl.³ C01C *3/08*
U.S. Cl. 423—267 13 Claims

1. Particulate cyanuric chloride mixture which is resistant to agglomeration during storage and handling and is resistant to undesirable hydrolysis comprising finely-divided particles of cyanuric chloride and from about 0.1% up to about 10% by weight, of at least one hydrophobic filler having a specific surface of at least 60 m^2/g., said filler being inert with respect to said cyanuric chloride.

4,329,326

PROCESS FOR PREPARING CRYSTALLINE AMMONIUM DIHYDROGEN PHOSPHATE

Soichi Asagao; Masaru Nakatani; Shinsuke Nakagawa; Yoshiyuki Takahara, and Naoki Okada, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Division of Ser. No. 70,499, Aug. 28, 1979, Pat. No. 4,269,814. This application Oct. 29, 1980, Ser. No. 201,724
Claims priority, application Japan, Aug. 30, 1978, 53-014864
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ C01B *25/28*
U.S. Cl. 423—308 5 Claims

1. A process for preparing crystalline ammonium dihydrogen phosphate from an aqueous solution of ammonium dihydrogen phosphate obtained from wet process phosphoric acid, comprising the steps of:

(a) adding into the ammonium dihydrogen phosphate aqueous solutior at least one compound selected from the group consisting of ethylenediamine tetraacetate, nitrilotriacetate, diethylenetrinitrilo pentaacetate, sodium pyrophosphate, sodium tripolyphosphate, and sodium hexametaphosphate, the amount of said compound added being within a range from 0.1 to 1.0 wt. percent relative to crystals of ammonium dihydrogen phosphate;

(b) heat-treating said aqueous solution at a temperature of 70° C. or more and for a time of 5 minutes or more, after addition of said compound; and

(c) crystallizing ammonium dihydrogen phosphate out of said aqueous solution after said heat-treating.

4,329,327

METHOD FOR MAKING B-FORM ALUMINUM TRIMETAPHOSPHATE FROM POWDER REACTANTS

James E. Neely, Jr., Butler; Annette Moff, Latrobe; Chia-Cheng Lin, Gibsonia, and Charlene A. Falleroni, Lower Burrell, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 26, 1980, Ser. No. 210,480
Int. Cl.³ C01B *25/36*
U.S. Cl. 423—314 4 Claims

1. A method for making the B-form of aluminum trimetaphosphate comprising the steps of:

a. thoroughly mixing together aluminum hydroxide and ammonium phosphate in approximately stoichiometric quantities; and

b. heating the mixture at a temperature of from about 630° to

about 640° C. for a sufficient time to obtain aluminum trimetaphosphate in predominantly the B-form.

4,329,328

METHOD OF SYNTHESIZING ZINCOSILICATE OR STANNOSILICATE OR TITANOSILICATE MATERIAL

Patrick McAnespie, Redcar; Alan Dyer, Manchester, and Bharati J. Mehta, Rochdale, all of England, assignors to National Research Development Corporation, London, England

Filed Oct. 16, 1980, Ser. No. 197,021

Claims priority, application United Kingdom, Oct. 19, 1979, 7936348

Int. Cl.³ C01B *33/20, 33/32*

U.S. Cl. 423—333 **14 Claims**

1. A method of synthesising a zincosilicate, stannosilicate or titanosilicate, comprising mixing an aqueous sodium zincate, stannate or titanate solution of concentration at least 0.5 M (in ZnO, SnO or TiO) with a source of silica in the molar ratio silica (as SiO_2):sodium zincate, stannate or titanate (as ZnO, SnO or TiO) of 3.3:1 to 1:5.5 and maintaining the mixture at a reaction temperature of from 15° C. to 100° C. for at least ½ hour, diluting the mixture at least twofold, allowing a precipitate to form and removing supernatant liquid therefrom and drying the residue.

4,329,329

PROCESS FOR OBTAINING CARBON BLACK FROM AQUEOUS SUSPENSIONS

Wilfried Dolkemeyer, Bornheim-Uedorf; Kurt Erdt; Rene Hentges, both of Wesseling, and Ewald Meisenburg, Heimerzheim, all of Fed. Rep. of Germany, assignors to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,363

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 2950705

Int. Cl.³ C01B *31/02*

U.S. Cl. 423—461 **8 Claims**

1. A process for obtaining carbon black from an aqueous suspension comprising the steps of mixing the aqueous suspension containing carbon black with liquid low-boiling hydrocarbons having from 3 to 10 C-atoms, then expanding the mixture in a single expansion step into a vessel which is at a lower pressure than that of the mixture without separating the components of the mixture, the single expansion step being carried out at a temperature of from 20° to 180 C. and at a pressure of from 2 to 30 bars in such a manner that the hydrocarbons are evaporated into a gaseous phase carrying the carbon black but only after expansion, then drawing off separately the gaseous phase of the evaporated hydrocarbons formed after expansion and carrying the carbon black, and the remaining liquid aqueous phase which is substantially free of carbon black from the expansion vessel, and separating the carbon black from the hydrocarbon vapour.

4,329,330

IODINE (VII) OXYTETRAFLUOROHYPOFLUORITE AND A PROCESS FOR PREPARING THE SAME

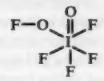
Karl O. Christe, Calabasas, and Richard D. Wilson, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 8, 1980, Ser. No. 176,314

Int. Cl.³ C01B *7/24*

U.S. Cl. 423—473 **5 Claims**

2. A compound having an empirical formula of $FOIF_4O$ which comprises a stereo-isomer selected from the group consisting of



cis

and

trans

and mixtures thereof.

5. A process for preparing $FOIF_4O$, comprising the steps of:

metathetically reacting solutions of NF_4SbF_6 and $CsIF_4O_2$ in anhydrous HF;

removing the $CsSbF_6$ precipitate and HF solvent; and

thermally decomposing the filtrate residue.

4,329,331

DIAGNOSTIC METHOD FOR DETECTION OF SYSTEMIC LUPUS ERYTHEMATOSUS

Charles A. Kallick, 181 W. 135 St., Lemont, Ill. 60439

Filed Mar. 13, 1980, Ser. No. 129,895

Int. Cl.³ G01N *33/54, 33/58;* **C12Q** *1/00;* **C12R** *1/90*

U.S. Cl. 424—8 **8 Claims**

1. A method for determining the presence of systemic lupus erythematosus in a patient which comprises contacting blood serum from said patient with anaplasma antigen derived from a vertebrate infected with an organism of the family Anaplasmataceae, and thereafter contacting said antigen with an indicator for human immunoglobulin components and determining the presence of systemic lupus erythematosus by a positive reaction to said indicator.

4. The method of claim 1 wherein said indicator is a goat-derived antihuman gamma globulin conjugated with fluorescein isothiocyanate and determining the presence of systemic lupus erythematosus by the presence of fluorescence in the product obtained by contacting said antigen with said indicator.

4,329,332

BIODEGRADABLE SUBMICROSCOPIC PARTICLES CONTAINING A BIOLOGICALLY ACTIVE SUBSTANCE AND COMPOSITIONS CONTAINING THEM

Patrick Couvreur, 8, Avenue de la Foret, 1970 Wezembeek-Oppem; Michel Roland, 38, rue Tomberg, 1150 Bruxelles, both of Belgium, and Peter Speiser, 26Wassbergerstrasse, 8127 Forch, Switzerland

Filed Jul. 16, 1979, Ser. No. 57,767

Claims priority, application Belgium, Jul. 19, 1978, 189366

Int. Cl.³ A61K *49/00;* **A61J** *3/00;* **A61K** *9/26;* **B01J** *13/02*

U.S. Cl. 424—9 **12 Claims**

1. Biodegradable particles having a diameter less than 500 nanometers for oral or parenteral administration in a human or animal host, said particles comprising a substantially spherical, dense, filamentous, polymeric network, wherein the polymeric network has dispersed therethrough a biologically active substance, and wherein said polymer is biodegradable in said host and is formed by the micellar polymerization of an alkyl cyanoacrylate said alkyl group containing 1 to 4 carbon atoms, and when said polymer particles are biodegraded in said host, the biologically active substance is progressively released into said host at a rate substantially corresponding to the rate of biodegradation of said polymer.

11. Biodegradable particles having a diameter less than 500 nanometers for use as a diagnostic agent, said particles comprising a substantially spherical, dense, filamentous, polymeric

network wherein the polymeric network has dispersed therethrough a biologically active substance, and wherein said polymer is biodegradable and is formed by the micellar polymerization of an alkyl cyano-acrylate in an aqueous solution of a surface active agent and at a pH less than 7, said alkyl containing 1 to 4 carbon atoms, and wherein said polymer particles are biodegraded in use as a diagnostic agent whereby the biologically active substance is progressively released at a rate substantially corresponding to the rate of biodegradation of said polymer.

4,329,333

METHOD FOR THE ORAL TREATMENT OF DOGS AND OTHER ANIMALS

Arthur Barr, 2942 Shore Dr., Merrick, N.Y. 11566

Filed Nov. 24, 1980, Ser. No. 209,933

Int. Cl.[3] A61K *9/50, 9/06;* **A61L** *15/03;* **A61F** *13/00*

U.S. Cl. 424—19 **13 Claims**

1. A method for the oral treatment of dogs, said method comprising forming a paste composition consisting essentially of microencapsulated droplets of liquid flavoring material and an anti-plaque agent in a paste carrier, said microencapsulated droplets being constituted of a coating which is substantially non-soluble in water but is soluble in the saliva of the mouth of a dog, said paste carrier being adhesive, adhering a quantity of the composition in the oral cavity of the dog whereafter the flavoring material and anti-plaque agent are conjointly slowly released in situ in the mouth at a sustained rate, the composition of the liquid flavoring material and anti-plaque agent and their encapsulation in the carrier being such that the droplets of material are slowly dissolved and mask mouth odor of the animal while the anti-plaque agent acts to inhibit plaque formation.

4,329,334

ANIONIC-AMPHOTERIC BASED ANTIMICROBIAL SHAMPOO

Dean T. Su, North Brunswick, and Warren R. Schubert, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,802

Int. Cl.[3] A61K *7/06, 7/09, 31/415*

U.S. Cl. 424—70 **9 Claims**

1. A clear, homogeneous, liquid, anionic-amphoteric based, antimicrobial, conditioning shampoo consisting essentially of 0.5% to 2.5% by weight of 1-imidazolyl-1-(4-chlorophenoxy)-3,3-dimethylbutan-2-one solubilized in about 65 to 80% of an aqueous vehicle containing 12% to 25% by weight of a water-soluble anionic, sulfated or sulfonated detergent containing an alkyl radical of 10 to 18 carbon atoms in its molecular structure, 0.5% to 5% by weight of a water-soluble amphoteric surfactant selected from the group consisting of a betaine, amidobetaine, sulfobetaine or amidosulfobetaine surfactant having an alkyl group of 10 to 16 carbon atoms in its molecular structure and 1% to 6% by weight of a C_{10}–C_{18} fatty acid mono- or di-ethanolamide.

4,329,335

AMPHOTERIC-NONIONIC BASED ANTIMICROBIAL SHAMPOO

Dean T. Su, North Brunswick, and Warren R. Schubert, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,536

Int. Cl.[3] A61K *7/06, 7/09, 31/415*

U.S. Cl. 424—70 **9 Claims**

1. A homogeneous liquid amphoteric-nonionic based antimicrobial conditioning shampoo containing about 0.5–2.5% of the water insoluble antimicrobial compound, 1-imidazolyl-1-(4-chlorophenoxy)-3,3-dimethylbutan-2-one, solubilized in an aqueous vehicle comprising:

a. about 6–30% by weight of a betaine, sulfobetaine, amidobetaine, amidosulfobetaine or combinations thereof,

b. about 1–7.5% by weight of a dimethyl higher alkyl tertiary amine oxide,

c. about 1–7% by weight of a higher fatty acid mono- or di-ethanolamide,

d. about 0.1–5% by weight of a polyoxyethylene hexitan mono-higher fatty acid ester containing 10–80 moles ethylene oxide per mole, and

e. about 65–80% water.

4,329,336

NONIONIC BASED ANTIMICROBIAL SHAMPOO

Dean T. Su, North Brunswick, and Warren R. Schubert, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,560

Int. Cl.[3] A61K *7/06, 7/09, 31/415*

U.S. Cl. 424—70 **7 Claims**

1. A homogeneous, liquid, nonionic based, antimicrobial, conditioning shampoo containing about 0.5–2.5% of 1-imidazolyl-1-(4-chlorophenoxy)-3,3-dimethyl butan-2-one solubilized in an aqueous vehicle, wherein the aqueous vehicle constitutes about 65–80% by weight of water containing four nonionic components comprising about 2–20% by weight of a polyoxyethylene hexitan mono-higher fatty acid ester having 10–20 carbon atoms in the higher acyl thereof and 10–80 mols ethylene oxide per mol, about 4–10% by weight of a dimethyl higher alkyl amine oxide having 10–16 carbons in the higher alkyl thereof, about 1–7% by weight of a higher fatty acid mono- or di-ethanolamide, and about 0.05–1.0% weight of a water-soluble polyacrylamide having an average molecular weight of 100,000 to 3,000,000.

4,329,337

TURKEY SEMEN EXTENDER

Thomas J. Sexton, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 29, 1981, Ser. No. 288,260

Int. Cl.[3] A61K *35/48*

U.S. Cl. 424—105 **12 Claims**

1. A medium for preserving and extending the viable useful life of turkey semen, in vitro, comprising a mixture of salts, sugar and amino acids in amounts effective in aqueous solution to extend the viability of said semen, said mixture of salts, sugar and amino acids being chemically balanced to provide the proper osmotic balance, hydrogen ion concentration, chelating action and energy required to extend the viability of the semen and wherein the pH of the solution is about 6.5 and the osmolarity is about 350 m. osmols.

4,329,338

COMPOSITIONS FOR USE AS COSMETICS

Ferenc Szego, and Antal Makk, both of Budapest, Hungary, assignors to Ferrokemia Ipari Szovetkezet, Budapest, Hungary

Filed Jan. 22, 1980, Ser. No. 114,425

Claims priority, application Hungary, Jun. 1, 1979, FE 1046

Int. Cl.[3] A61K *31/70, 31/455;* **C07H** *13/10*

U.S. Cl. 424—180 **11 Claims**

1. A composition for topical application having vasodilator effect, containing 0.06 to 10% by weight, calculated on the total weight of the composition, of a reaction product of nicotinic acid, a nicotinic acid salt or a nicotinic acid halide and a polyol selected from the group consisting of glucose, mannitol, sorbitol, glucosamine hydrochloride, ethylene glycol, polyethylene glycol, dipropylene glycol, propylene glycol, arabite and 4,6-O-benzylidene-D-glycopyranose together with a diluent acceptable for topical application.

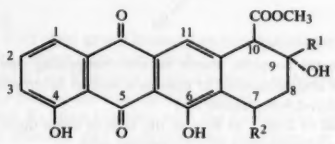
4,329,339

ANTHRACYCLINONES AND DERIVATIVES THEREOF

Akiko Fujiwara; Tatsuo Hoshino, both of Kamakura, and Masaaki Tazoe, Yokohama, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

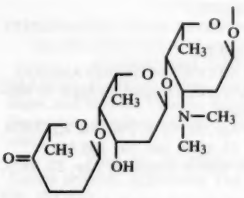
Filed May 21, 1980, Ser. No. 152,003
Int. Cl.[3] A61K *31/71*; C07H *15/26*
U.S. Cl. 424—180 6 Claims

1. A compound of the formula



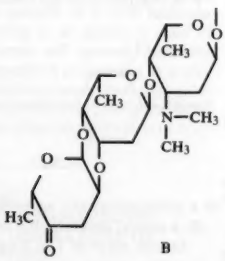
I

wherein R^1 represents a methyl or acetonyl group and R^2 represents a group of the formula



or

A



B

6. A pharmaceutical composition useful in the treatment of bacterial infections which comprises as an active ingredient a compound selected from the group consisting of auramycin A, auramycin B, sulfurmycin A and sulfurmycin B in combination with a pharmaceutically compatible carrier.

4,329,340

PHARMACEUTICAL COMPOSITION HAVING ANTIPHLOGISTIC, ANTIPYRETIC AND ANALGESIC ACTIVITY

Giancarlo Sportoletti, Milan, Italy, assignor to Italfarmaco S.p.A., Milan, Italy

Filed Dec. 8, 1980, Ser. No. 214,204
Claims priority, application Italy, Aug. 5, 1980, 23998 A/80
Int. Cl.[3] A61K *31/625*
U.S. Cl. 424—232 6 Claims

1. The method of relieving a living subject affected by inflammation, which consists of administering to said subject a composition containing imidazole salicylate as the active ingredient in the amount of 100–600 mgs per unit dose 1–4 times a day.

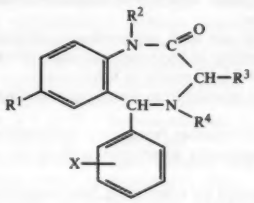
4,329,341

5-PHENYL-1,3,4,5-TETRAHYDRO-2H-1,4-BENZODIAZEPIN-2-ONES, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Julianna Röchricht; Lajos Kisfaludy; Marton Kajtar; Eva Palosi, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

Filed Nov. 26, 1980, Ser. No. 178,679
Int. Cl.[3] A61K *31/55*; C07D *243/24*
U.S. Cl. 424—244 10 Claims

1. An optically active or racemic compound of the formula (I)



(I)

wherein

R^1 stands for hydrogen, halogen, trifluoro-methyl or a nitro group;

R^2 stands for hydrogen or alkyl having 1 to 6 carbon atoms;

R^3 is methyl, isopropyl, isobutyl, sec-butyl, benzyl, hydroxymethyl, β-hydroxyethyl, p-hydroxybenzyl, carbamoylmethyl, β-carbamoylethyl, carboxymethyl, β-carboxylethyl, mercaptomethyl, β-methylthioethyl, 4-amino-n-butyl, 3-guanidino-n-propyl, 3-indolylmethyl and 4-imidazolylmethyl;

R^4 is hydrogen, chlorocarbonyl or carbamoyl; and

X is hydrogen, halogen or trifluoro-methyl, with the proviso that if in the racemic compounds R^4 stands for hydrogen R^3 is other than alkyl having 1 to 6 carbon atoms, in which the centres of asymmetry in the 3- and 5-positions have the same absolute configuration, and pharmaceutically acceptable acid addition salts thereof.

7. Pharmaceutical composition having enzyme inducing activity, which comprises as an active ingredient an effective amount of at least one racemic or optically active compound of the general formula (I) (wherein R^1, R^2, R^3, R^4 and X have the same meaning as defined in claim 1), or a pharmaceutically acceptable acid addition salt thereof, in admixture with inert solid or liquid pharmaceutical carrier.

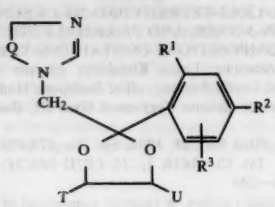
4,329,342

1-(2-ARYL-4,5-DISUBSTITUTED-1,3-DIOXOLAN-2-YLMETHYL)-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

Jan Heeres, Vosselaar; Leo Backx, Arendonk; Willy Van Laerhoven, Beerse, all of Belgium, and Elmar Sturm, Aesch, Switzerland, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation of Ser. No. 53,639, Jun. 29, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 202,964
Claims priority, application Switzerland, Jul. 24, 1978, 7963/78; Jul. 25, 1978, 8001/78
Int. Cl.[3] A01N *43/50, 43/64*; C07D *405/06*
U.S. Cl. 424—245 27 Claims

1. A chemical compound selected from the group consisting of an azole derivative having the formula:



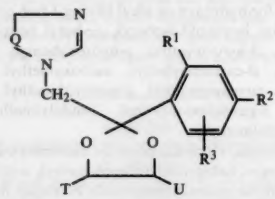
and the phytopharmaceutically acceptable acid addition salts, metal salt complexes and stereochemically isomeric forms thereof, wherein

R^1, R^2 and R^3 are each independently selected from the group consisting of hydrogen and halo, provided that at least one of R^1, R^2 and R^3 is halo;

Q is a member selected from the group consisting of CH and N;

T and U taken together represent a tetramethylene radical which is optionally substituted with up to two methyl groups.

10. A composition for combatting fungi comprising an inert carrier material and as an active ingredient an effective antifungal amount of a compound selected from the group consisting of an azole derivative having the formula:



and the phytopharmaceutically acceptable acid addition salts, metal salt complexes and stereochemically isomeric forms thereof, wherein

R^1, R^2 and R^3 are each independently selected from the group consisting of hydrogen and halo, provided that at least one of R^1, R^2 and R^3 is halo;

Q is a member selected from the group consisting of CH and N;

T and U taken together represent a tetramethylene radical which is optionally substituted with up to two methyl groups.

4,329,343

PYRROLE AMIDES AND THERAPEUTIC USE THEREOF

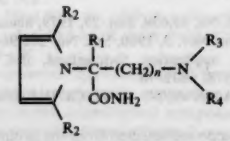
Claude Bernhart, St. Gely du Fesc; Jean P. Gagnol, St. Martin de Londres, and Patrick Gautier, Cournonterral, all of France, assignors to Sanofi, Paris, France

Filed Jan. 26, 1981, Ser. No. 228,053

Int. Cl.[3] **A61K** *31/535, 31/40;* **C07D** *413/06, 207/327*

U.S. Cl. 424—248.54 **5 Claims**

1. Derivatives of pyrrole of formula



(I)

in which:

R_1 represents an atom of hydrogen, a lower alkyl group, a phenyl radical or a pyridyl-2 radical,

R_2 represents an atom of hydrogen or a lower alkyl radical,

R_3 and R_4, which are identical or different, each represent a lower alkyl or cycloalkyl radical, or the group

designates a cyclic amine radical comprising one or 2 cycles and being able to possess a second heteroatom on dimethyl-2,6-piperidine and

n is equal to 2 or 3, as well as the salts of these derivatives with a pharmaceutically acceptable acid,

3. A process for treating arrhythmia and blood platelet aggregation in a mammal comprising administering an effective amount of a compound as defined in claim **1**.

4,329,344

4-(PHENYLALKYL)PIPERAZINE-1-CARBOXAMIDES

Michael S. Hadley, Sawbridgeworth, England, assignor to Beecham Group Limited, England

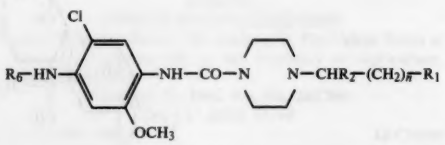
Division of Ser. No. 894,942, Apr. 10, 1978, Pat. No. 4,223,034. This application May 12, 1980, Ser. No. 149,182

Claims priority, application United Kingdom, Apr. 22, 1977, 16765/77

Int. Cl.[3] **C07D** *241/04, 211/28;* **A61K** *31/495*

U.S. Cl. 424—250 **17 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof wherein

R_1 is phenyl unsubstituted or substituted with fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms;

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms;

n is 0, 1 or 2; and

R_6 is hydrogen, COR_4 or CO_2R_4 wherein R_4 is alkyl of 1 to 4 carbon atoms unsubstituted or substituted with one, two or three chlorine atoms or with three fluorine atoms on the same carbon atom.

17. A pharmaceutical tranquilizing composition which comprises an effective amount of a compound as claimed in claim **1** in combination with a pharmaceutically acceptable carrier.

4,329,345

N-(-2-PYRIMIDINYL)-4-ARYL-4-[N'-(ALKYLAMINO ALKYL)]-PIPERIDINAMIDE

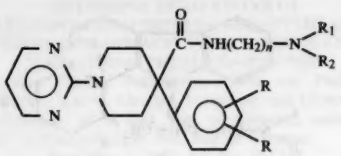
James R. Shroff, Riverside, Conn., and Rohit Desai, Yonkers, N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,469

Int. Cl.[3] **C07D** *211/28;* **A61K** *31/44*

U.S. Cl. 424—251 **5 Claims**

1. A compound having anti-arrhythmic activity selected from the group consisting of compounds of the formula



wherein

R is H or alkyl group having 1 to 6 carbon atoms,

n is an integer from 2 to 4 and

R_1 and R_2 are hydrogen or alkyl having 1 to 6 carbon atoms and may be the same or different, or

R_1 and R_2 taken together with the nitrogen to which they are attached may be pyrrolidino, piperidino, or morpholino and

their pharmaceutically acceptable, nontoxic acid addition salts.

4,329,346

PHARMACEUTICAL COMPOSITIONS CONTAINING 2,6-BIS-(DIETHANOLAMINO)-4-PIPERIDINO-PYRIMIDO[5,4-d]PYRIMIDINE

Jean-Claude Jardillier, Reims; Yves Carpentier, Rilly la Montagne, and Bernard Desoize, Reims, all of France, assignors to Boehringer Ingelheim GmbH, Ingelheim, Fed. Rep. of Germany

Filed Jul. 21, 1980, Ser. No. 170,913

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931573

Int. Cl.³ A61K *31/505*

U.S. Cl. 424—251 **2 Claims**

1. A method for inhibiting the growth of L-1210 leukemia cells which comprises administering to an animal in need of such treatment an L-1210 leukemia cell growth inhibiting amount of a pharmaceutical composition comprising as active ingredient 2,6-bis-(diethanolamino)-4-piperidino-pyrimido-[5,4-d]pyrimidine or a pharmacologically acceptable acid addition salt thereof, and one or more pharmaceutical carriers or diluents.

4,329,347

CARDIOTONIC AND ANTITHROMBOTIC SULFUR-CONTAINING DERIVATIVES OF CARBOSTYRIL

Erich Müller; Josef Nickl; Josef Roch; Berthold Narr; Walter Haarmann, and Johannes M. Weisenberger, all of Biberach an der Riss, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

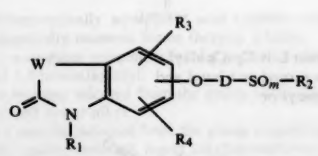
Continuation-in-part of Ser. No. 10,221, Feb. 8, 1979, abandoned. This application Jul. 24, 1980, Ser. No. 172,009

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931741; Feb. 17, 1978, 2806721; Dec. 9, 1978, 2853314

Int. Cl.³ A61K *31/47*; C07D *215/22*

U.S. Cl. 424—251 **9 Claims**

1. A compound of the formula



wherein

W is vinylene, methyl-vinylene, or ethylene;

m is 0, 1, or 2;

D is straight or branched alkylene of 2 to 6 carbon atoms, straight or branched hydroxy-alkylene of 3 to 6 carbon atoms, or xylylene;

R_1 is hydrogen or alkyl of 1 to 3 carbon atoms;

R_2 is cycloalkyl of 3 to 6 carbon atoms; aryl of 6 or 10 carbon atoms, alkylaryl of 7 to 10 carbon atoms, or aralkyl of 7 to 11 carbon atoms, where the aryl nucleus may be unsubstituted or mono-substituted by alkyl of 1 to 4 carbon atoms, hydroxyl, methoxy, amino, acetylamino, nitro, carboxyl, cyclohexyl, phenyl, or halogen, and a mono-substituted phenyl moiety may, in addition, be mono- or di-substituted by alkyl of 1 to 4 carbon atoms, halogen, or both, where said substituents on the phenyl moiety may be identical or different from each other; triphenylmethyl; N-methyl-cyclohexylamino-carbonylmethyl; amino-iminomethyl; pyridyl; pyridylmethyl; furfuryl; benzimidazolyl; benzthiazolyl; pyrimidyl; 1,2,4-triazolyl; quinolyl; quinazoline-4-one-yl; 4,5-bis-(p-chlorphenyl)-oxazole-2-yl; pyridyl-oxide; methylpyridyl; methoxypyridyl; fluoropyridyl; chloropyridyl; aminopyridyl; acetylaminopyridyl; or, when m is 1 or D is hydroxyalkylene or xylylene, also alkyl of 1 to 6 carbon atoms; and

R_3 and R_4 are each hydrogen, halogen, alkyl of 1 to 4 carbom atoms, amino, acetylamino or nitro.

8. A cardiotonic or antithrombotic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective cardiotonic or antithrombotic amount of a compound of claim 1.

9. The method of increasing the strength of the heart muscle contraction or preventing or relieving thrombosis in a warm-blooded animal in need of such treatment, which comprises perorally, parenterally or rectally administering to said animal an effective cardiotonic or antithrombotic amount of a compound of claim 1.

4,329,348

N-OXACYCLIC-ALKYLPIPERIDINES AS PSYCHOSTIMULANTS

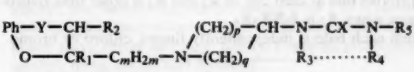
Charles F. Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 15,539, Feb. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 888,089, Mar. 20, 1978, abandoned. This application Sep. 12, 1980, Ser. No. 186,776

Int. Cl.³ A61K *31/505, 31/445*; C07D *405/14*

U.S. Cl. 424—251 **8 Claims**

6. A method for the treatment or management of depression and minimal brain dysfunction, which comprises administering to a mammal, suffering therefrom, enterally or parenterally a pharmaceutical composition comprising an effective amount of a compound of formula I having psychostimulant activity



(I)

wherein Ph is unsubstituted 1,2-phenylene or 1,2-phenylene substituted by one to three identical or different members selected from lower alkyl, hydroxy, mercapto, lower alkoxy, lower alkylenedioxy, benzyloxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro or amino; each of R_1 and R_2 is hydrogen or lower alkyl; each of R_3 and R_4 is hydrogen, lower alkyl or (R_3+R_4) is Ph or lower alkylene separating both nitrogens by 2 to 4 carbon atoms; R_5 is hydrogen, lower alkyl, HPh-lower alkyl or HPh; X is oxo, thio, imino or lower alkylimino; Y is epoxy, epithio or sulfinyl; m is an integer from 1 to 7; each of p and q is an integer from 1 to 3, but (p+q)=4; the N-oxide or a pharmaceutically acceptable acid addition salt thereof; together with a pharmaceutical excipient.

4,329,349

6-C_{1-4}ALKYL-7-PHENYL OR SUBSTITUTED PHENYL-1,6-NAPHTHYRIDINE-5(6H)-ONES

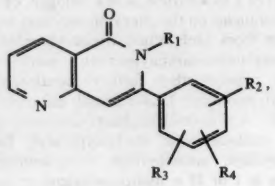
Robert E. Damon, II, Randolph, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., East Hanover, N.J.

Continuation-in-part of Ser. No. 60,729, Jul. 25, 1979, abandoned. This application Jul. 24, 1980, Ser. No. 171,824

Int. Cl.³ C07D *471/04;* A61K *31/435*

U.S. Cl. 424—256 **26 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

R_1 is C_{1-4}alkyl,

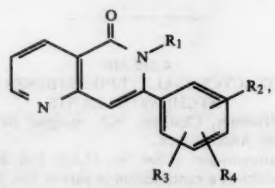
R_2 is hydrogen, C_{1-4}alkyl, halo, trifluoromethyl, C_{1-4}alkylthio or $-NR_5R_6$, wherein each of R_5 and R_6 is independently hydrogen or C_{1-3}alkyl,

R_3 is hydrogen, C_{1-3}alkyl, halo or trifluoromethyl, and

R_4 is hydrogen, C_{1-3}alkyl or halo,

wherein each halo is independently fluoro, chloro or bromo.

21. A method of treating muscle spasms comprising administering to a mammal in need of said treatment a muscle relaxant effective amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

R_1 is C_{1-4}alkyl,

R_2 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, halo, trifluoromethyl, C_{1-4}alkylthio or $-NR_5R_6$, wherein each of R_5 and R_6 is independently hydrogen or C_{1-3}alkyl,

R_3 is hydrogen, C_{1-3}alkyl, C_{1-3}alkoxy, halo or trifluoromethyl, and

R_4 is hydrogen, C_{1-3}alkyl, C_{1-3}alkoxy or halo, with the proviso that at least one of R_3 and R_4 is other than hydrogen when R_2 is 4-NR_5R_6,

wherein each halo is independently fluoro, chloro or bromo.

4,329,350

1,1-DISUBSTITUTED OCTAHYDRO-INDOLO[2,3-a]QUINOLIZINES, PROCESS FOR THE PREPARATION THEREOF AND COMPOSITIONS CONTAINING SAME

Csaba Szantay; Lajos Szabo; György Kalaus; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

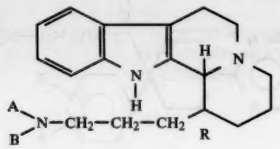
Continuation-in-part of Ser. No. 10,720, Feb. 8, 1979, abandoned. This application May 21, 1979, Ser. No. 41,192

Claims priority, application Hungary, Feb. 10, 1978, RI 658

Int. Cl.³ A61K *31/40;* C07D *455/02*

U.S. Cl. 424—258 **8 Claims**

1. A compound of the formula:



wherein

R is alkyl having 1 to 6 carbon atoms;

A is C_1 to C_6 alkyl where the alkyl is unbranched in the 1-position; phenyl- or naphthyl-C_1 to C_6 alkyl where the alkyl is unbranched in the 1-position; methoxy-phenyl- or methoxy-naphthyl-C_1 to C_6 alkyl where the alkyl is unbranched in the 1-position; C_1 to C_7 alkanoyl; benzoyl or methoxybenzoyl; and

B is hydrogen;

or a pharmaceutically acceptable acid addition salt thereof.

8. A method of treating an animal subject to induce vasodilating which comprises administering to said subject an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

4,329,351

2-SUBSTITUTED PROPOXY-3-CYANO-5-RO-PYRIDINES AND INTERMEDIATES

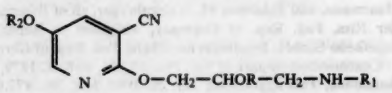
John J. Baldwin, Gwynedd Valley, and Gerald S. Ponticello, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 1, 1979, Ser. No. 80,822

Int. Cl.³ A61K *31/44;* C07D *211/90, 211/72*

U.S. Cl. 424—263 **12 Claims**

1. A compound of the formula



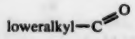
and pharmaceutically acceptable salts thereof wherein

R is H or

wherein L is C_1–C_6 alkyl,

R_1 is isopropyl or t-butyl and

R_2 is benzyl or



8. A pharmaceutical composition for treating hypertension containing an effective amount of a compound of claim **1** and a carrier.

4,329,352
PIPERIDINE DERIVATIVES OF 3-HYDROXY-THIOPHENE-2-CARBOXYLIC ACID ESTERS AND PHARMACEUTICAL FORMULATIONS CONTAINING THESE COMPOUNDS

Fritz-Frieder Frickel, Deidesheim; Gerda von Philipsborn, Weinheim; Claus D. Mueller, Viernheim, and Dieter Lenke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

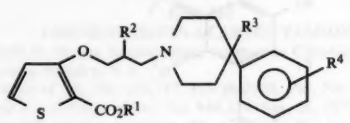
Filed Dec. 3, 1980, Ser. No. 212,631

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950064

Int. Cl.[3] A61K *31/445*; C07D *417/12*; A61K *31/38*

U.S. Cl. 424—267 **4 Claims**

1. A compound of the formula I



(I)

where

R^1 is alkyl of 1 to 6 carbon atoms,

R^2 is hydrogen or hydroxyl,

R^3 is hydrogen, hydroxyl or carboalkoxy, where alkoxy is of 1 to 3 carbon atoms, and

R^4 is hydrogen, halogen, trifluoromethyl or alkoxy of 1 to 3 carbon atoms, and the phenyl ring may possess 1 or 2 such R^4 substituents, and its physiologically tolerated addition salts with acids.

4. A composition for treating cardiac arrhythmias which comprises an amount of a compound of formula I of claim 1 or a physiologically tolerated acid addition salt thereof effective for treating cardiac arrhythmias, and a pharmaceutically acceptable carrier or diluent.

4,329,353
1-(4-ARYL-CYCLOHEXYL)PIPERIDINE DERIVATIVES, METHOD OF USE THEREOF AND PHARMACEUTICAL COMPOSITIONS THEREOF

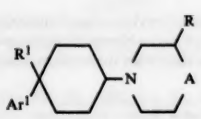
Raymond A. Stokbroekx, Beerse; Joannes J. M. Willems, Turnhout, and Marcel G. M. Luyckx, Geel, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 199,142, Oct. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 128,705, Mar. 10, 1980, abandoned. This application Jan. 9, 1981, Ser. No. 222,091

Int. Cl.[3] A61K *31/445*; C07D *471/10, 401/04*

U.S. Cl. 424—267 **12 Claims**

1. A chemical compound represented by the formula



(I)

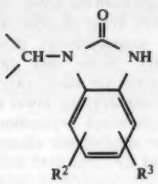
the pharmaceutically acceptable acid addition salts and the stereochemically isomeric forms thereof, wherein

Ar^1 is a member selected from the group consisting of aryl and 1,3-benzodioxolyl;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is a member selected from the group consisting of hydrogen, cyano, carboxyl, lower alkyloxycarbonyl, aryllower alkyloxycarbonyl, aminocarbonyl, mono- and di(lower alkyl)aminocarbonyl, mono- and di(aryllower alkyl-)aminocarbonyl, (aryllower alkyl)lower alkylamino-carbonyl, hydroxy, lower alkyloxy, lower alkylcarbonyloxy, formyl, lower alkylcarbonyl, arylcarbonyl, aryllower alkylcarbonyl, lower alkyl, lower alkenyl, lower alkynyl and cyclohexyl; and

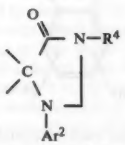
A has the formula



(a)

wherein R^2 and R^3 are each independently selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkyl and lower alkyloxy; or

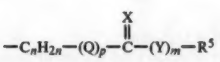
A has the formula



(b)

wherein Ar^2 is aryl, and

R^4 is a member selected from the group consisting of hydrogen, lower alkyl, aryllower alkyl, cyanolower alkyl, aminolower alkyl, mono- and di(lower alkyl)aminolower alkyl, mono- and di(aryllower alkyl)amino-lower alkyl, lower alkyl, hydroxy-lower alkyl, mercaptolower alkyl, lower alkyloxylower alkyl, lower alkylthiolower alkyl, aryloxylower alkyl, arylthiolower alkyl, aryllower alkyloxylower alkyl, aryllower alkylthiolower alkyl, and a radical of formula

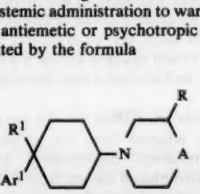


wherein n is 0 or an integer of from 1 to 6 inclusive, Q is O, S or NR^6, p is 0 or 1, X is O or S, R^5 is hydrogen, lower alkyl, aryl or aryllower alkyl, m is 0 or 1 and Y is O, S or NR^6, wherein R^6 as used in the definition of Q and Y is hydrogen, lower alkyl, aryl or aryllower alkyl:

provided that when Y is O and m and p are each 1 than R^5 is other than hydrogen and provided that when p is 1 than n is other than 0;

wherein aryl, whether used alone or as a portion of another term, is a member selected from the group consisting of phenyl, thienyl, pyridinyl, naphthalenyl and substituted phenyl, said substituted phenyl having from 1 to 3- substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, phenyl lower alkyloxy, trifluoromethyl, nitro, amino and hydroxy.

9. A method of inhibiting emesis or mental disorders which comprise the systemic administration to warm-blooded animals of an effective antiemetic or psychotropic amount of a compound represented by the formula



(I)

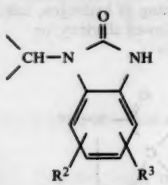
the pharmaceutically acceptable acid addition salts and the stereo-chemically isomeric forms thereof, wherein

Ar^1 is a member selected from the group consisting of aryl and 1,3-benzodioxolyl;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is a member selected from the group consisting of hydrogen, cyano, carboxyl, lower alkyloxycarbonyl, aryllower alkyloxycarbonyl, aminocarbonyl, mono- and di(lower alkyl)aminocarbonyl, mono- and di(aryllower alkyl-)aminocarbonyl, (aryllower alkyl)lower alkylamino- carbonyl, hydroxy, lower alkyloxy, lower alkylcarbonyloxy, formyl, lower alkylarbonyl, arylcarbonyl, aryllower alkylcarbonyl, lower alkyl, lower alkenyl, lower alkynyl and cyclohexyl; and

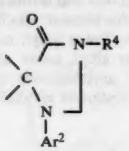
A has the formula



(a)

wherein R^2 and R^3 are each independently selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkyl and lower alkyloxy; or

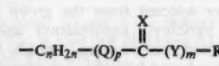
A has the formula



(b)

wherein Ar^2 is aryl, and

R^4 is a member selected from the group consisting of hydrogen, lower alkyl, aryllower alkyl, cyanolower alkyl, aminolower alkyl, mono- and di(lower alkyl)aminolower alkyl, mono- and di(aryllower alkyl)-aminololower alkyl, lower alkyl, hydroxylower alkyl, mercaptolower alkyl, lower alkyloxylower alkyl, lower alkylthiolower alkyl, aryloxylower alkyl, arylthiolower alkyl, aryllower alkyloxylower alkyl, aryllower alkylthiolower alkyl, and a radical of formula



wherein n is o or an integer of from 1 to 6 inclusive, Q is O, S or NR^6, p is o or 1, X is O or S, R^5 is hydrogen, lower alkyl, aryl or aryllower alkyl, m is o or 1 and Y is O, S or NR^6, wherein R^6 as used in the definition of Q and Y is hydrogen, lower alkyl, aryl or aryllower alkyl; provided that when Y is O and m and p are each 1 than R^5 is other than hydrogen and provided that when p is 1 than n is other than o;

wherein aryl, whether used alone or as a portion of another term, is a member selected from the group consisting of phenyl, thienyl, pyridinyl, naphthalenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, phenyl lower alkyloxy, trifluoromethyl, nitro, amino and hydroxy.

4,329,354

THIAZOLINE AND IMIDAZOLINE DERIVATIVES USEFUL AS ANTIDEPRESSANTS

Erwin Ringwald, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

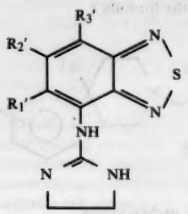
Filed May 23, 1980, Ser. No. 152,713

Claims priority, application United Kingdom, Jun. 1, 1979, 19264/79; Jun. 1, 1979, 19265/79

Int. Cl.³ A61K *31/425*

U.S. Cl. 424—270 **8 Claims**

1. A method of treating depression which comprises administering to a subject in need of such treatment a therapeutically effective amount of a compound of formula I'a



I'a

wherein each of R_1', R_2' and R_3', independently, is hydrogen, halo, C_{1-4} alkyl, C_{1-4} alkoxy, nitro, cyano, hydroxy or C_{1-4} alkylthio, said compound being in free base or in pharmaceutically acceptable acid addition salt form.

4,329,355

MESOIONIC ANTITUMOR COMPOSITIONS AND METHODS FOR USING THE SAME IN THE TREATMENT OF CANCER

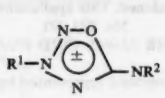
David W. Henry, 119 Meadowbrook Dr., Chapel Hill, N.C. 27514; Kenneth J. Ryan, 754 Lakemuir Dr., Sunnyvale, Calif. 94086, and Edward W. Grange, 3480 Waverley St., Palo Alto, Calif. 94306

Filed Mar. 1, 1979, Ser. No. 16,384

Int. Cl.³ A61K *31/42*

U.S. Cl. 424—272 **8 Claims**

1. A process for treating leukemia which comprises administering to a warm-blooded animal having an abnormal proportion of leukocytes an effective amount for treating leukemia of a compound selected from the group having the structure



wherein R^1 represents phenyl or phenyl substituted by methyl, nitro or chloro groups, and wherein R^2 represents hydrogen or a methyl group, together with their pharmaceutically acceptable salts.

4,329,356

TREATMENT OF HYPERTENSION WITH FLUOXETINE AND L-5-HYDROXYTRYPTOPHANE

Donald R. Holland, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 31, 1980, Ser. No. 202,847

Int. Cl.³ A61K *31/40, 31/135, 31/195, 31/24, 31/15*

U.S. Cl. 424—274 **16 Claims**

1. A method for lowering blood pressure in a hypertensive mammal in need of treatment which comprises the co-administration of hypotensively effective amounts of fluoxetine and l-5-hydroxytryptophane or pharmaceutically acceptable salts thereof, the amount of said combination administered being

significantly effective to reduce the blood pressure of said hypertensive mammal, compared to each alone.

6. A method for lowering blood pressure in hypertensive mammals in need of treatment which comprises the co-administration of hypotensively-effective amounts of fluoxetine, and l-5-tryptophan or pharmaceutically acceptable salts thereof, the amount of said combination, compared to each alone, being significantly effective to reduce the blood pressure of said hypertensive mammals plus a peripheral decarboxylase inhibitor in an amount sufficient to prevent side effects attributable to serotonin.

13. A method for lowering blood pressure in hypertensive mammals in need of treatment which comprises the administration to such a mammal of an antihypertensive amount of fluoxetine or a pharmaceutically-acceptable salt thereof.

4,329,357
1-BENZOTHIEPIN-4-CARBOXYAMIDES

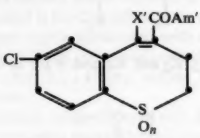
Melvin H. Rosen, Kendall, Fla., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 119,717, Feb. 8, 1980, Pat. No. 4,277,484, which is a division of Ser. No. 944,218, Sep. 20, 1978, Pat. No. 4,226,998, which is a division of Ser. No. 854,176, Nov. 23, 1977, Pat. No. 4,185,109, which is a continuation of Ser. No. 743,208, Nov. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 585,147, Jun. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,524, Sep. 26, 1974, abandoned. This application Feb. 9, 1981, Ser. No. 232,494

Int. Cl.³ A61K *31/38*

U.S. Cl. 424—275 **3 Claims**

1. A method of treating inflammatory, arthritic and dermatopathologic conditions in mammals which consists in administering to them enterally, parenterally or topically a pharmaceutical composition comprising an antiinflammatory effective amount of a compound of the formula



in which X' is hydroxy or pyrrolidino, Am' is mono- or di(-fluoro or chloro)phenylamino and n is the integer 0 or 1, or the sodium, potassium, ammonium, mono-, di or tri-(methyl or ethyl)ammonium, pyrrolidinium, morpholinium, anilinium or 2-pyridylammonium salt of the compounds with X'=OH, together with one or more pharmaceutically acceptable excipients.

4,329,358
3-CHLOROPHENYL ANTI-OBESITY AGENTS

Anthony T. Ainsworth, Cranleigh, and David G. Smith, Redhill, both of England, assignors to Beecham Group Limited, England

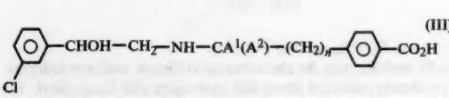
Filed Oct. 24, 1980, Ser. No. 200,430

Claims priority, application United Kingdom, Oct. 25, 1979, 7937084

Int. Cl.³ A61K *31/24*; C07C *101/42*

U.S. Cl. 424—309 **10 Claims**

1. A compound of formula (III)



and esters, amides and pharmaceutically acceptable salts thereof, wherein

A^1 is hydrogen or methyl;

A^2 is hydrogen or methyl; and

n is 1, 2 or 3.

4. A pharmaceutical composition having anti-obesity activity comprising a pharmaceutically effective amount of a compound according to claim 1 in association with a pharmaceutically acceptable carrier therefor.

6. A method for treating obesity in humans and domestic manuals which comprises administering an effective, non-toxic amount of a pharmaceutical composition according to claim 4.

4,329,359
METHOD FOR IMPROVING THE METABOLIC STABILITY AND SURVIVAL OF NEWBORN PIGS

Tim S. Stahly, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Filed Dec. 28, 1979, Ser. No. 107,886

Int. Cl.³ A61K *31/23, 31/22, 31/045*

U.S. Cl. 424—312 **6 Claims**

1. A method of treating a pregnant sow to improve the metabolic stability of newborn pigs and to increase the survival rate of said newborn pigs which comprise administering to the pregnant sow during its late stages of gestation an effective amount of a material selected from the group consisting of a dihydroxy alkanol having 3 to 10 carbon atoms, a triglyceride of glycerol and fatty acids containing 8 to 12 carbon atoms and the mono- and diol esters of said alkanols and said fatty acids.

4,329,360
BENZOPHENONES AND THEIR USE AS FUNGICIDES

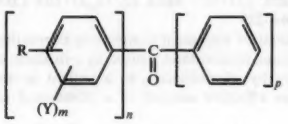
Bruce M. Resnick, West Paterson, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,806

Int. Cl.³ A01N *37/06*; C07C *69/54, 69/017*

U.S. Cl. 424—314 **3 Claims**

1. The process of applying a compound, having the formula



wherein Y is halo, hydroxy or lower alkyl optionally substituted with halogen; m has a value of from 0 to 2; n has a value of 1 or 2; p is 0 when n is 2 and 1 when n is 1, and R is a radical selected from the group consisting of acrylate or methacrylate, to a plant in an amount sufficient to prevent or control fungus infestation.

4,329,361
USE OF ROSMARINIC ACID IN THE TREATMENT OF INFLAMMATIONS AND PHARMACEUTICAL PRODUCTS USED THEREIN

Meinhard Zenk, München-Pasing; Eugen Etschenberg, Cologne, and Erich Graf, Kerpen, all of Fed. Rep. of Germany, assignors to Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,421

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952114

Int. Cl.³ A61K *31/19*

U.S. Cl. 424—317 **2 Claims**

1. A method for the treatment of humans suffering from inflammatory diseases and disorders comprising administering to said humans a pharmaceutical preparation containing rosmarinic acid, in a daily dose ranging from 50 to 1000 mg of rosmarinic acid.

4,329,362

2-AMINO-4-(SUBSTITUTED HYDRAZINO)-6-OXO PYRIMIDINES

Robert W. Morrison, Jr.; William R. Mallory, and Virgil L. Styles, all of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

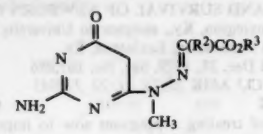
Division of Ser. No. 922,545, Jul. 7, 1978, Pat. No. 4,225,710. This application May 13, 1980, Ser. No. 149,255

Claims priority, application United Kingdom, Jul. 8, 1977, 28765/77

Int. Cl.³ C07D *239/36*

U.S. Cl. 424—320 **4 Claims**

1. A compound of the formula III



(III)

or a tautomer or salt thereof wherein R^3 is lower alkyl, and R^2 is lower alkyl, lower carboxylic acid acyloxymethyl, phenyl, benzyl unsubstituted or substituted in the phenyl ring with one or more hydroxy or lower alkoxy, CH_2OCOR^4 wherein R^4 is lower alkyl, indolyl or indolylmethyl, $CH(CN)CH_2C_6H_5$ unsubstituted or substituted in the phenyl ring with one or more lower alkoxy, $CH(Y)CO_2Z$ or $CH_2CH_2CO_2Z$ in which Y and Z are hydrogen or lower alkyl, in the above lower alkyl, alkoxy or acyl have 1 to 6 carbon atoms.

4,329,363

SUBSTITUTED MERCAPTO ACID AMIDES AND THEIR USE

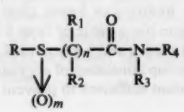
Conrad P. Dorn, Plainfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 939,293, Sep. 8, 1978, Pat. No. 4,216,160. This application Jan. 16, 1980, Ser. No. 112,581

Int. Cl.³ C07C *153/057*; A61K *31/16, 31/165*; C07C *103/127*

U.S. Cl. 424—320 **14 Claims**

1. A method of treatment comprising correcting an imbalance of immune homeostasis, caused by cytostatic treatment or radiotherapy by administering to a patient in need of such treatment an effective amount of a compound of structural formula:

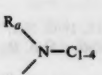


wherein,

m is 0 to 2;

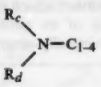
n is 1 to 17;

R is (a) hydrogen; (b) C_{1-18} alkyl; (c) halo C_{1-6} alkyl, (d) C_{1-10} cycloalkyl; (e) ar C_{1-6} alkyl; (f) C_{1-4} alkoxy C_{1-6} alkyl; (g) ar C_{1-6} alkenyl; (h) aroxy C_{1-6} alkyl; (i) hydroxy C_{1-6} alkyl, (j)



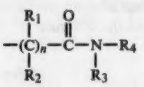
alkyl, where R_a and R_b are independently selected from hydrogen, C_{1-4} alkyl and phenyl; (k) C_{1-4} alkoxycarbonyl C_{1-6} alkyl; (l) C_{1-4} alkylthio C_{1-6} alkyl; (m) acyl C_{1-6} alkyl; (n) C_{1-10} alkenyl; (o) C_{1-10} cycloalkenyl; (p) C_{1-10} alkynyl; (q) aryl and substituted aryl; (t) acyloxy C_{1-6} alkyl; (u)

where R_5 is (1) C_{1-18} alkyl; (2) C_{1-10} cycloalkyl; (3) ar C_{1-6} alkyl; (4) C_{1-4} alkoxy C_{1-6} alkyl; (5) aroxy C_{1-6} alkyl; (6) hydroxy C_{1-6} alkyl; (7) acyl C_{1-6} alkyl; (8) C_{1-4} alkoxycarbonyl; (9) C_{1-4} alkoxycarbonyl C_{1-6} alkyl; (10) acyloxy C_{1-6} alkyl; (11)



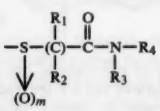
alkyl, where R_c and R_d are independently selected from hydrogen, C_{1-4} alkyl and phenyl; (12) C_{1-18} alkenyl; (13) C_{1-10} cycloalkenyl; (14) ar C_{1-6} alkenyl; (15) C_{1-10} alkynyl; (16) aryl and substituted aryl; (19) C_{1-10} alkoxy; (20) halo C_{1-6} alkyl; and (21)

where R_e and R_f are independently selected from hydrogen, C_{1-4} alkyl, and phenyl;



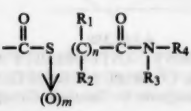
(v)

where R_1, R_2, R_3 and R_4, and n are as defined herein;



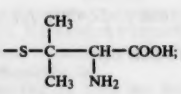
(w)

where R_1, R_2, R_3 and R_4, and m and n are as defined herein;



(x)

where R_1, R_2, R_3 and R_4, and n are as defined herein;



(z)

(aa) SO_3Na; or (bb) PO_3Na_2:

R_1 and R_2 may be the same or different and are independently selected from (a) hydrogen; (b) C_{1-10} alkyl; (c) C_{1-10} cycloalkyl; (d) ar C_{1-6} alkyl, and substituted ar C_{1-6} alkyl; (e) C_{1-4} alkoxy C_{1-6} alkyl; (f) aroxy C_{1-6} alkyl; (g) hydroxy C_{1-6} alkyl; (h)

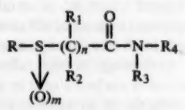
alkyl, where R_g and R_h are independently selected from hydrogen, C_{1-4} alkyl, and phenyl; (i) C_{1-4} alkylthio C_{1-6} alkyl; (j) acyl, (k) acyl C_{1-6} alkyl; (l) C_{1-4} alkoxy-carbonyl C_{1-6} alkyl; (m) C_{1-10} alkenyl; (n) C_{1-10} alkynyl; (o) aryl and substituted aryl; and (r) halo C_{1-6} alkyl; and

R_3 and R_4 may be the same or different and are independently selected from (a) hydrogen; (b) C_{1-18} alkyl; (c) C_{1-10} cycloalkyl; (d) ar C_{1-6} alkyl and substituted ar C_{1-6} alkyl; (e) C_{1-4} alkoxy C_{1-6} alkyl; (f) aroxy C_{1-6} alkyl; (g) hydroxy C_{1-6} alkyl; (h)

alkyl, where R_i and R_j are independently selected from hydrogen, C_{1-4} alkyl, and phenyl; (i) C_{1-4} alkylthio C_{1-6} alkyl; (j) C_{1-4} alkoxycarbonyl C_{1-6} alkyl; (k) C_{1-10} alkenyl; (l) C_{1-10} cycloalkenyl; (m) C_{1-6} alkynyl; (n) aryl and substituted aryl; (q) halo C_{1-6} alkyl; and (r)

where R_5 is as defined above wherein acyl is lower alkanoyl, wherein aryl is C_1–C_{10} carbocyclic aryl, and wherein said substituted aryl is substituted with one or more substituents selected from the group consisting of halo, halomethyl, C_{1-4} alkyl, C_{1-4} alkoxy, sulfide, sulfoxy, sulfonyl, nitro, and cyano.

8. A pharmaceutical composition in unit dosage form comprising a pharmaceutically acceptable carrier and 5 mg. to 5 g. of an active ingredient compound of structural formula:

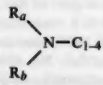


wherein,

m is 0 to 2;

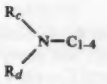
n is 1 to 17;

R is (a) hydrogen; (b) C_{1-18} alkyl; (c) halo C_{1-6} alkyl, (d) C_{1-10} cycloalkyl; (e) ar C_{1-6} alkyl; (f) C_{1-4} alkoxy C_{1-6} alkyl; (g) ar C_{1-6} alkenyl; (h) aroxy C_{1-6} alkyl; (i) hydroxy C_{1-6} alkyl, (j)



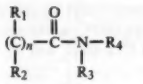
alkyl, where R_a and R_b are independently selected from hydrogen, C_{1-4} alkyl and phenyl; (k) C_{1-4} alkoxycarbonyl C_{1-6} alkyl; (k) C_{1-4} alkylthio C_{1-6} alkyl; (m) acyl C_{1-6} alkyl; (n) C_{1-10} alkenyl; (o) C_{1-10} cycloalkenyl; (p) C_{1-10} alkynyl; (q) aryl and substituted aryl; (t) acyloxy C_{1-6} alkyl; (u)

where R_5 is (1) C_{1-18} alkyl; (2) C_{1-10} cycloalkyl; (3) ar C_{1-6} alkyl; (4) C_{1-4} alkoxy C_{1-6} alkyl; (5) aroxy C_{1-6} alkyl; (6) hydroxy C_{1-6} alkyl; (7) acyl C_{1-6} alkyl; (8) C_{1-4} alkoxycarbonyl; (9) C_{1-4} alkoxycarbonyl C_{1-6} alkyl; (10) acyloxy C_{1-6} alkyl; (11)



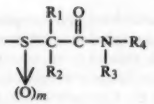
alkyl, where R_c and R_d are independently selected from hydrogen, C_{1-4} alkyl and phenyl; (12) C_{1-18} alkenyl; (13) C_{1-10} cycloalkenyl; (14) ar C_{1-6} alkenyl; (15) C_{1-10} alkynyl; (16) aryl and substituted aryl; (19) C_{1-10} alkoxy; (20) halo C_{1-6} alkyl; and (21)

where R_e and R_f are independently selected from hydrogen, C_{1-4} alkyl, and phenyl;



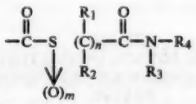
(v)

where R_1, R_2, R_3 and R_4, and n are as defined herein;



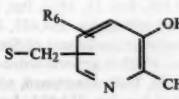
(w)

where R_1, R_2, R_3 and R_4, and m and n are as defined herein;



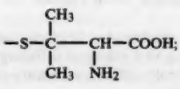
(x)

where R_1, R_2, R_3 and R_4, and n are as defined herein;



(y)

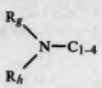
where R_6 is 4- or 5-: hydroxymethylene, mercaptomethylene, vinyl, or ethynyl;



(z)

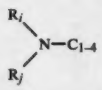
(aa) SO_3Na; or (bb) PO_3Na_2;

R_1 and R_2 may be the same or different and are independently selected from (a) hydrogen; (b) C_{1-10} alkyl; (c) C_{1-10} cycloalkyl; (d) ar C_{1-6} alkyl, and substituted ar C_{1-6} alkyl; (e) C_{1-4} alkoxy C_{1-6} alkyl; (f) aroxy C_{1-6} alkyl; (g) hydroxy C_{1-6} alkyl; (h)



alkyl, where R_g and R_h are independently selected from hydrogen, C_{1-4} alkyl, and phenyl; (i) C_{1-4} alkylthio C_{1-6} alkyl; (j) acyl, (k) acyl C_{1-6} alkyl; (l) C_{1-4} alkoxy-carbonyl C_{1-6} alkyl; (m) C_{1-10} alkenyl; (n) C_{1-10} alkynyl; (o) aryl and substituted aryl; and (r) halo C_{1-6} alkyl; and

R_3 and R_4 may be the same or different and are independently selected from (a) hydrogen; (b) C_{1-18} alkyl; (c) C_{1-10} cycloalkyl; (d) ar C_{1-6} alkyl and substituted ar C_{1-6} alkyl; (e) C_{1-4} alkoxy C_{1-6} alkyl; (f) aroxy C_{1-6} alkyl; (g) hydroxy C_{1-6} alkyl; (h)



alkyl, where R_i and R_j are independently selected from hydrogen, C_{1-4} alkyl, and phenyl; (i) C_{1-4} alkylthio C_{1-6} alkyl; (j) C_{1-4} alkoxycarbonyl C_{1-6} alkyl; (k) C_{1-10} alkenyl; (l) C_{1-10} cycloalkenyl; (m) C_{1-6} alkynyl; (n) aryl and substituted aryl; (q) halo C_{1-6} alkyl; and (r)

where R_5 is as defined above said composition being useful for correction of an imbalance of immune homestasis, caused by cytostatic treatment or radiotherapy in patients affected by such animbalance wherein acyl is lower alkanoyl, wherein aryl is C_1–C_{10} carbocyclic aryl, and wherein said substituted aryl is substituted with one or more substituents selected from the group consisting of halo, halomethyl, C_{1-4} alkyl, C_{1-4} alkoxy, sulfide, sulfoxy, sulfonyl, nitro, and cyano.

4,329,364

ANTIANDROGENIC AGENTS AND METHODS FOR THE TREATMENT OF ANDROGEN DEPENDENT DISEASE STATES

Rudolph O. Neri, Hawthorne, and John G. Topliss, West Caldwell, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 505,116, Sep. 11, 1974, Pat. No. 3,995,060, and a continuation-in-part of Ser. No. 264,655, Jun. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,461, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 876,999, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 734,854, Jun. 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 573,836, Aug. 22, 1966, abandoned. This application Sep. 23, 1976, Ser. No. 725,821

Int. Cl.³ A61K *31/165*

U.S. Cl. 424—324 **1 Claim**

1. A method for the treatment of prostatic carcinoma which comprises administering to a mammal suffering from prostatic carcinoma a therapeutically effective quantity of 4'-nitro-3'-trifluoromethylisobutyranilide.

4,329,365

FLUKICIDAL COMPOUNDS

Morton Harfenist, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

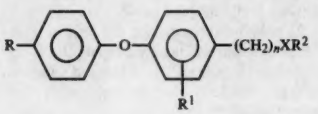
Filed May 29, 1979, Ser. No. 43,490

Claims priority, application United Kingdom, May 30, 1978, 24035/78

Int. Cl.³ A01N *37/18*; C07C *102/00*

U.S. Cl. 424—324 **12 Claims**

1. A diphenylether of the formula



or an acid addition salt thereof wherein

R is selected from monoalkanoylamino and dialkanoylamino, both of one to four carbon atoms;

R^1 is selected from hydrogen, alkyl of one to four carbon atoms, alkenyl of two to five carbon atoms and halo;

R^2 is alkyl of one to four carbon atoms;

X is S or SO_2: and

n is 0, 1, 2 or 3.

4. A veterinary formulation for the treatment of liver fluke infection which comprises a diphenylether as defined in any of claims 1 to 3, in an anti-fluke infection effective amount, in association with a veterinarily acceptable carrier therefor.

10. A method for the treatment of liver fluke infections in a mammal comprising the administration to said mammal of an anti-fluke infection effective amount of a diphenylether as defined in any of claims 1 to 3.

4,329,366

TOPICAL ACYLAMINOPHENOLS

Wilson Nashed, North Brunswick; David T. Rovee, Bridgewater, and Robert J. Gander, Whitehouse, all of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Division of Ser. No. 92,296, Nov. 8, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,862

Int. Cl.³ A61K *31/165*

U.S. Cl. 424—324 **11 Claims**

1. A method of topical treatment of an inflammatory condition comprising applying to the affected area an anti-inflammatory agent selected from the group consisting of the N-acylaminophenols containing normal aliphatic side chains having from six to twelve carbon atoms in a pharmaceutically acceptable topical vehicle, in an amount sufficient to combat said inflammatory condition.

4,329,367

1-(ARALKOXYPHENYL)-2-(BIS-ARYLALKYLAMINO)-ALKANES

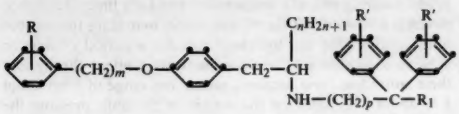
John E. Francis, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 74,441, Sep. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 882,004, Feb. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,508, Apr. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 699,016, Jun. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 590,221, Jun. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 494,948, Aug. 5, 1974, abandoned. This application Dec. 24, 1980, Ser. No. 219,808

Int. Cl.³ A61K *31/135*; C07C *87/28*

U.S. Cl. 424—330 **6 Claims**

1. A compound corresponding to the formula



wherein R is hydrogen, m- or p-(chloro or trifluoromethyl), each of R_1 and R' are hydrogen, each of m and n is the integer 1 and p is the integer 2, or a therapeutically useful acid addition salt thereof.

5. A pharmaceutical composition for the treatment of hypertension comprising an antihypertensive effective amount of a compound as claimed in claim 1, together with a pharmaceutical excipient.

6. A method of treating hypertension in mammals, which consists in administering to said mammals enterally or parenterally an antihypertensive effective amount of a composition as claimed in claim 5.

4,329,368
PROCESS FOR PRESERVATION OF STORED WOOD CHIPS

Edward L. Springer, Madison, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 8, 1979, Ser. No. 47,172
Int. Cl.³ A01N *33/18, 35/02*
U.S. Cl. 424—334 **2 Claims**

1. A method for preserving wood substance, tall oil and brightness in stored wood chips comprising treating said chips with a biocidally effective amount of an aqueous solution containing from 1.0 to 2.0 percent formaldehyde and from 0.40 to 0.80 percent para-nitrophenol.

2. A method for retarding deterioration in cereal straws, reeds, corn stover, kenaf, sugar cane bagasse, and wood, comprising treating the material with an aqueous solution containing from 1.0 to 2.0 percent formaldehyde and from 0.40 to 0.80 percent para-nitrophenol.

4,329,369
PROCESS FOR PREPARATION OF CHEWING GUM

Shichigoro Tezuka, Kawasaki; Yoshinori Sato, Niiza; Masaki Shibata, Tokyo, and Nobuyuki Harikae, Funabashi, all of Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1980, Ser. No. 169,748
Claims priority, application Japan, Mar. 3, 1980, 55-25210
Int. Cl.³ A23G *3/30*
U.S. Cl. 426—3 **6 Claims**

1. In a process of preparing a chewing gum which comprises admixing a gum base comprising conventional ingredients with conventional chewing gum additives, the improvement comprising charging all of the ingredients of the gum base and all of the chewing gum additives into a single pressurizing apparatus and kneading said ingredients and additives therein under a pressure of about 4 to 10 kg/cm² for 10 to 25 min. at the mass temperature of about 40° to 60° C. in a single step.

4,329,370
PROCESS FOR PRODUCING SOLID KOJI

Fumio Noda, Kamagaya; Kazuya Hayashi, Kashiwa; Keitaro Mogi, Noda; Takashi Iwaasa, Noda; Takeji Mizunuma, Noda, and Toshio Sakasai, Noda, all of Japan, assignors to Kikkoman Shoyu Co. Ltd., Chiba, Japan

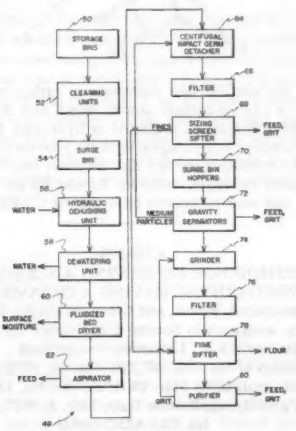
Filed Jun. 2, 1980, Ser. No. 155,166
Claims priority, application Japan, Jun. 6, 1979, 54-69974
Int. Cl.³ A23L *1/20*
U.S. Cl. 426—46 **8 Claims**

1. In a process for producing a solid koji for a fermented food product which comprises inoculating a koji mold in a modified koji substrate having a water content of from about 40% to about 50% by weight and cultivating it at a temperature of about 20° C. to about 40° C. for a time sufficient to produce a solid koji for fermented food products, the improvement wherein at a certain time during a period of about 10 hours to about 20 hours after the inoculation of the koji mold, the cultivation system is subjected to a drying treatment to adjust its water content to about 30±3% and thereafter the cultivation is continued for a total cultivation time of from about 30 to about 100 hours.

4,329,371
METHOD OF PROCESSING GRAIN

Edwin R. Hart, Allen, Tex., assignor to Seven-H Corporation, Richardson, Tex.

Continuation-in-part of Ser. No. 729,376, Oct. 4, 1976, Pat. No. 4,126,707. This application Nov. 20, 1978, Ser. No. 962,558
The portion of the term of this patent subsequent to Nov. 21, 1995, has been disclaimed.
Int. Cl.³ A23L *1/10, 1/20*
U.S. Cl. 426—461 **27 Claims**



1. A method of processing grain comprising the steps of:
mixing water with the grain to form a slurry;
pumping the slurry successively in a turbulent flow through a plurality of pump stages, to separate the husks from the kernels of the grain without cracking a substantial percentage of the kernels;
removing excess water from the grain slurry to leave moist kernels and moist husks;
surface drying the moist kernels and moist husks to leave a surface dried mixture of husks and kernels, and then
aspirating the surface dried mixture to remove the husks from the kernels.

4,329,372
ETHYL 3-MERCAPTOPROPIONATE AS A GRAPE FLAVOR

Michael G. Kolor, Pearl River, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jun. 12, 1980, Ser. No. 158,846
Int. Cl.³ A23L *1/235*
U.S. Cl. 426—535 **4 Claims**

1. A process for imparting a Concord grape flavor to a foodstuff which comprises adding thereto a flavoring composition consisting essentially of synthetically-produced, substantially-pure ethyl 3-mercaptopropionate in an amount sufficient to effect a level of said compound in the foodstuff, as consumed, of from 100 parts per billion to 50 parts per million by weight.

4,329,373
USE OF CARBOAMIDOALKYL NORBORNANES FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF A FOODSTUFF

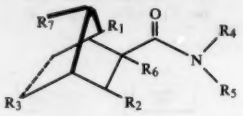
Philip T. Klemarczyk, Old Bridge; Frederick L. Schmitt, Holmdel; Edward J. Granda, Englishtown, and Domenick Luccarelli, Jr., Ocean, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 206,632, Nov. 13, 1980, which is a continuation-in-part of Ser. No. 152,188, Jul. 17, 1980, abandoned. This application May 28, 1981, Ser. No. 268,112

Int. Cl.³ A23L *1/235*

U.S. Cl. 426—538 **3 Claims**

1. A process for augmenting or enhancing the grapefruit aroma or taste of a foodstuff which comprises adding thereto from about 0.002 ppm up to about 50 ppm by weight of said foodstuff of at least one norbornane derivative defined according to the structure:



wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond and wherein R_2 is methyl or hydrogen; R_6 is methyl or hydrogen; R_1, R_3, or R_7 represent methyl or hydrogen, with the proviso that one of R_1, R_3 and R_7 represents methyl and the other two of R_1, R_3 and R_7 represent hydrogen; wherein R_4 and R_5 are the same or different and each represents hydrogen or C_1–C_3 lower alkyl.

4,329,374
METHOD FOR PRODUCING A STERILIZED PROCESSED CHEESE HAVING A CREAMY TEXTURE

Rutilio Invernizzi, Milan, and Giovanni Prella, Vercelli, both of Italy, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 882,220, Feb. 28, 1978, abandoned. This application Mar. 14, 1980, Ser. No. 130,568

Claims priority, application Italy, Mar. 2, 1977, 48268 A/77

Int. Cl.³ A23C *19/00*

U.S. Cl. 426—582 **7 Claims**

1. A process for producing a sterilised processed cheese having a creamy texture which comprises preparing a starting material cheese mass to be melted, sterilising this mass by melting at a temperature above 120° C., reducing the sterilised mass to a temperature of from 60° to 100° C. and developing at that temperature the normal texture of a processed cheese that has not been thermally sterilised in the mass by dispersing in it 0.5 to 20% of a texturising agent consisting of an essentially sterile casein having a creamy texture, said texturising agent prepared by:

(a) providing a thermally sterilised processed cheese having a glutinous texture;

(b) diluting in the sterilised cheese a nonsterilised processed cheese having a creamy texture to provide a partially sterile, creamy textured processed cheese; and

(c) repeating steps (a) and (b), each time diluting a thermally sterilised processed cheese with the partially sterile cheese produced in step (b), until an essentially sterilised processed cheese having a creamy texture is obtained.

4,329,375
LOW-FAT NUTS WITH IMPROVED NATURAL FLAVOR

Oris E. Holloway, Jr., and Howard Wilkins, both of Brookfield, Conn., assignors to Nabisco Brands, Inc., New York, N.Y.

Filed Oct. 21, 1980, Ser. No. 198,986

Int. Cl.³ A23L *1/36*

U.S. Cl. 426—632 **21 Claims**

1. A process for preparing reduced calorie roasted nuts while reducing the loss of natural roasted flavor, which comprises: roasting nuts at a temperature and for a time effective to develop a roasted nut flavor and color; hydrating the roasted nuts; equilibrating the hydrated nuts for a period of time to achieve a substantially uniform moisture content throughout their individual cross sections, within the range of from about 4 to about 8%, based on the weight of the nuts; pressing the nuts under conditions effective to remove from about 20 to about 55% of the oil content of the nuts; hydrating the nuts to a moisture content sufficient to cause the nuts to regain approximately their normal shape; and roasting the nuts to fully develop the flavor and color thereof.

4,329,376
METHOD FOR STABILIZING THE TEXTURE OF A PLASTIC SUBSTANCE

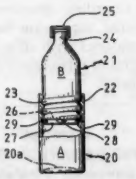
Elemer Szigeti, 1 Place Eugene Mo, Nice (Alpes Maritimes), France

Division of Ser. No. 60,517, Jul. 25, 1979, abandoned. This application Oct. 17, 1980, Ser. No. 198,094

Claims priority, application France, Jul. 25, 1979, 79 10596

Int. Cl.³ A65B *33/00*

U.S. Cl. 427—4 **1 Claim**



1. A method of rendering innocuous animal excrement, comprising

providing a container including first and second individual compartments for respectively holding first and second constituents of a fast-acting and non-toxic polyurethane rigid foam setting material, and setting material discharge means comprising a discharge tip forming an intergral part of said first individual compartment of said container, said first and second compartments being tubular and mutually engaged through a helicoidal ramp; a first puncturable web at the bottom of said first compartment; a second puncturable web at the upper part of said second compartment; and web-perforating means between said first and second compartments whereby said two compartments are independent and fluid-tight and said web-perforating means simultaneously tears said first and second webs when said two compartments are screwed together through said helicoidal ramp;

screwing said two compartments together to effect tearing of said first and second webs and mixing of the two separate constituents and formation of polyurethane foam;

applying the discharge tip of said device adjacent the animal excrement; and

coating the animal excrement with polyurethane foam from said device.

4,329,377

PROCESS FOR COATING WIRE WITH INSULATION

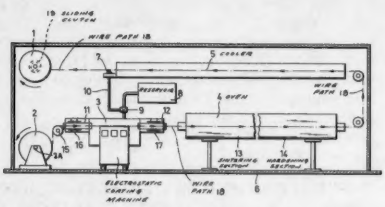
Wolfgang Voelker, Arolsen; Alfons Schmitt, Neuhof, and Fritz Radeck, Arolsen, all of Fed. Rep. of Germany, assignors to Felten & Guilleaume Carlswerk Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 167,323

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1979, 2930870

Int. Cl.³ B05D *1/06, 7/20*

U.S. Cl. 427—9 7 Claims



1. In a process in which wire and like continuous and elongated bodies are coated with a lacquer substance by assembling a quantity of the substance in a pulverized form, establishing a potential difference between said quantity and the wire, passing the wire adjacent said quantity and thereby causing the substance to electrostatically adhere to the wire, sintering substance adhered to the wire, hardening substance so sintered, and cooling the substance and wire after sintering and hardening, an improvement, comprising: keeping a speed at which the wire is passed adjacent the quantity of substance constant; measuring thickness of the coated wire not immediately after the adherence of the substance to the wire, but at least after the sintering and hardening of the substance on the wire; comparing such thickness with a desired thickness; and continuously regulating the quantity of substance present in direct dependence upon results derived from said comparing step in a manner that actual thickness as measured corresponds to said desired thickness within a predetermined tolerance.

4,329,378

METHOD FOR MARKING AN INDICATION TO THE LENS

Niro Tarumi; Makoto Tsuchiya, and Kunio Sasaki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Hoya Lens (Hoya Lens Corporation), Tokyo, Japan

Filed Dec. 11, 1979, Ser. No. 102,348

Int. Cl.³ B05D *5/06*

U.S. Cl. 427—157 4 Claims

1. A method of marking an indication on a plastic eyeglass lens which indication is visible only in ultraviolet light, said process comprising the steps of:

(1) printing the desired symbol or letter on the plastic lens surface with a fluorescent dyestuff present to the extent of about 0.05 to about 10% by weight, said dye-stuff contained in an organic solvent solution, and thereafter

(2) drying the thus printed fluorescent dyestuff solution at about 60° to about 90° C. for 1 to 10 minutes thereby causing the fluorescent dyestuff solution to be transmitted into the interior of the pastic lens.

4,329,379

PROCESS FOR FORMING TIN OXIDE GLASS COATING

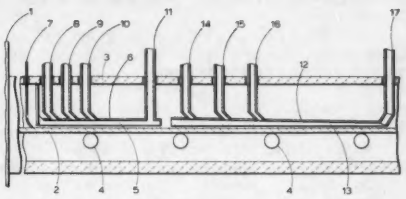
Robert Terneu, Thimeon, and Albert Van Cauter, Charleroi, both of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Oct. 17, 1979, Ser. No. 85,475

Claims priority, application United Kingdom, Oct. 19, 1978, 41164/78

Int. Cl.³ B05D *5/06*

U.S. Cl. 427—166 26 Claims



1. A process for forming a tin oxide coating on a hot glass substrate by chemical reaction of tin halide supplied in the vapour phase comprising: conveying the hot substrate through a first coating zone in which it is contacted with an acetylacetonate of titanium, nickel or zinc to cause deposition of a metal oxide undercoating on the substrate, and immediately conveying the still hot substrate through a second coating zone in which the metal oxide coating is contacted by a gaseous medium comprising a tin halide to cause deposition of a coating of tin oxide.

4,329,380

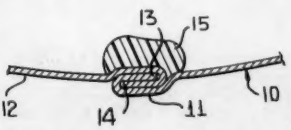
CONTAINER AND METHOD AND APPARATUS FOR THE COATING OF SAME

Aage M. Johansen, Odense, Denmark, and Olav A. Ronold, deceased, late of Odense, Denmark (by Ronold Turid, Heir), assignors to A/S Haustrups Fabriker, Odense, Denmark

Continuation-in-part of Ser. No. 683,674, May 5, 1976, abandoned. This application Aug. 4, 1978, Ser. No. 931,038

Int. Cl.³ B05D *7/22*

U.S. Cl. 427—236 12 Claims



1. A method of coating a container surface which is particularly subjected to a chemical reaction and wherein the surface is of a nature wherein it is particularly difficult to obtain coating adherence, said method including the steps of providing a nozzle and forcing a stream of lacquer out of the nozzle onto the surface, the method being characterized in that the lacquer is a thixotropic lacquer.

7. An apparatus for coating a container side seam, said apparatus comprising a nozzle, means for supplying a thixotropic lacquer to said nozzle under pressure, and said nozzle having means for delivering the thixotropic lacquer to a container side seam in at least two adjacent spaced apart separate streams, the spacing between said streams being within a range wherein the lacquer of the adjacent stream flows together to form a continuous band.

4,329,381

METHOD FOR PROVIDING CORROSION RESISTANCE TO METAL OBJECTS

Helmut Eschwey, Odenthal, Fed. Rep. of Germany; Joachim Galinke, deceased, late of Langenfeld, Fed. Rep. of Germany; Renate Galinke, nee Jansen, heir, Langenfeld, Fed. Rep. of Germany; Heinrich Linden, Düsseldorf-Holthausen, Fed. Rep. of Germany; Bernd Wegemund, Haan, Fed. Rep. of Germany, and Norbert Wiemers, Monheim-Baumberg, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,696

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807698; Jun. 3, 1978, 2824508

Int. Cl.³ C09D *5/08*

U.S. Cl. 427—386 **7 Claims**

1. The method of providing corrosion resistance to a metal object which comprises the steps of applying to said object a layer of a corrosion-protective composition which contains a corrosion-protecting amount of at least one zinc and/or lead salt selected from the group consisting of zinc, lead and mixed lead/zinc salts of mercaptobenzothiazoles, mercaptopyridines, single or polynuclear-s-triazines containing at least one hydroxyl or mercapto group on the triazine ring, cyanuric acid and thiocyanuric acid, in a film-forming vehicle, and then drying said layer to form a continuous coating thereon.

4,329,382

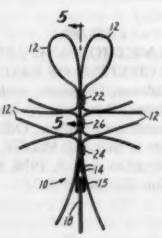
SELF-LOCKING RIBBON ASSEMBLIES

Bernard S. Truskolaski, Lake Elmo, and Daniel P. Pohl, Grant Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 7, 1980, Ser. No. 204,884

Int. Cl.³ D04D *7/10*

U.S. Cl. 428—4 **8 Claims**



1. A ribbon assembly adapted to be formed into a bow, said ribbon assembly comprising:

a pull member of a first width and having a first end;

a pair of elongate bow ribbons having first ends generally aligned with the first end of said pull member, being attached to said pull member at a location adjacent said first ends, having a width wider than said first width, being disposed on opposite sides of said pull member with edge portions of said bow ribbons extending past the adjacent edges of said pull member on both sides, being attached together at spaced attachment locations along said edge portions including a first set of opposite attachment locations spaced a predetermined distance from said first ends and a second set of generally opposite attachment locations adjacent the ends of said bow ribbons opposite said first ends, and having end portions adjacent said first ends which end portions have edge surfaces with portions spaced at a distance corresponding to the spacing between said first set of attachment locations and parts projecting beyond said edge surface portions of a width adapted to move between said attachment locations so that when said bow ribbons are held adjacent said second set of attachment locations and said pull member is pulled to move said first ends toward and through said first set of attachment locations, said attachment locations will gather adjacent each other, portions of said bow ribbons between said attachment locations and between said attachment locations and said end portions will billow outwardly to form a bow, said edge surface portions on the end portions of said bow ribbons will engage and be stopped by said first set of attachment locations, and said parts of said end portions will pass and extend between said first attachment locations; and

self-locking means adapted to be pulled to a position on the side of said second set of attachment locations opposite said first set of attachment locations upon formation of said bow, which self-locking means will resist movement back through said second set of attachment locations to hold said attachment locations adjacent each other and retain the shape of said bow.

4,329,383

NON-THROMBOGENIC MATERIAL COMPRISING SUBSTRATE WHICH HAS BEEN REACTED WITH HEPARIN

Yasushi Joh, Yokohama, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Division of Ser. No. 60,054, Jul. 24, 1979. This application Jul. 21, 1980, Ser. No. 170,656

Int. Cl.³ A61F *1/00;* **B01D** *39/18;* **D01D** *5/24*

U.S. Cl. 428—36 **8 Claims**

1. A shaped article comprising a hollow fiber having an interior wall with a non-thrombogenic surface, said non-thrombogenic surface being prepared by reacting an aldehyde group or aldehyde groups or an aldehyde forming group or aldehyde forming groups on the interior wall with heparin.

7. A shaped article selected from the group consisting of a tube, a hollow fiber, a film and a sheet, coated with a non-thrombogenic material prepared by reacting cellulose ester with a cleaving agent to develop adjacent aldehyde groups on said cellulose ester and binding heparin to said adjacent aldehyde groups through acetal bond or hemiacetal bond at each bonding site between said heparin and said cellulose ester.

4,329,384

PRESSURE-SENSITIVE ADHESIVE TAPE PRODUCED FROM PHOTOACTIVE MIXTURE OF ACRYLIC MONOMERS AND POLYNUCLEAR-CHROMOPHORE-SUBSTITUTED HALOMETHYL-2-TRIAZINE

George F. Vesley, Hudson, Wis., and John D. Moon, Hastings, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 14, 1980, Ser. No. 121,403

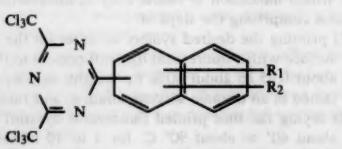
Int. Cl.³ C08F *2/50;* **C09J** *7/02;* **B05D** *3/06*

U.S. Cl. 428—40 **19 Claims**

1. Pressure-sensitive adhesive tape comprising a backing member and at least one adhesive layer produced from a photoactive mixture comprising by weight

(a) 50–100 parts of alkyl acrylate and 0–50 parts of copolymerizable monoethylenically unsaturated monomer and

(b) 0.01 to 2 parts of a polynuclear-chromophore-substituted halomethyl-s-triazine of the formula



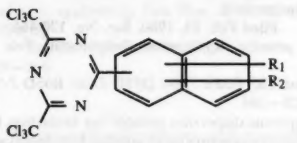
wherein each of R_1 and R_2 is hydrogen, alkyl, or alkoxy.

11. Method of making a pressure-sensitive adhesive tape comprising the steps of

(1) mixing by weight

(a) 100 parts of a composition comprising 50–100 parts of alkyl acrylate monomer and 0–50 parts of copolymerizable monoethylenically unsaturated monomer, which composition is polymerizable or has been polymerized to a pressure-sensitive adhesive state and

(b) 0.01 to 2 parts of a polynuclear-chromophore-substituted halomethyl-s-triazine of the formula



wherein each of R_1 and R_2 is hydrogen, alkyl or alkoxy,

(2) coating the mixture onto a backing member, and

(3) exposing the coated mixture to ultraviolet radiation.

17. Method of making a pressure-sensitive adhesive tape comprising the steps of:

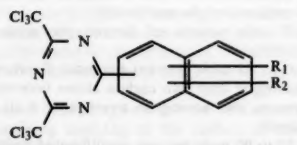
(1) mixing by weight

(a) 100 parts of an unpolymerized composition of 50–100 parts of alkyl acrylate and 0–50 parts of copolymerizable monoethylenically unsaturated monomer comprising polar groups, which composition is polymerizable to a pressure-sensitive adhesive state, and,

(b) an addition-polymerization photoinitiator which is activatable by ultraviolet radiation, is not a crosslinking agent, and is dissolved in an amount providing 0.001 to 0.5 percent of the composition (a),

(2) exposing the mixture to ultraviolet radiation to provide a partially-polymerized syrup having a viscosity of 300 to 20,000 centipoises at ordinary room temperature,

(3) mixing with said syrup 0.01 to 2 parts of a polynuclear chromophore-substituted halomethyl-s-triazine of the formula



wherein each of R_1 and R_2 is hydrogen, alkyl, or alkoxy,

(4) coating said syrup onto a backing member to provide a layer having a thickness of about 25–250 micrometers, and

(5) in an inert atmosphere, irradiating the coating with ultraviolet radiation to further polymerize it to a substantially completely polymerized, crosslinked, pressure-sensitive adhesive state.

18. Method of making a pressure-sensitive adhesive tape as defined in claim 17 wherein said unpolymerized composition comprises (i) 88–99 parts of alkyl acrylate having 4–12 carbon atoms in its alkyl group or alkyl acrylates having an average of 4–12 carbon atoms in their alkyl groups and (ii) correspondingly 12–1 parts of a copolymerizable monomer.

4,329,385

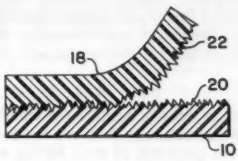
TEXTURING POLYMER SURFACES BY TRANSFER CASTING

Bruce A. Banks, Olmsted Township, Cleveland County; Albert J. Weigand, Lakewood, and James S. Sovey, Strongsville, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 19, 1980, Ser. No. 218,587

Int. Cl.³ B29D *7/02;* **C23C** *15/00;* **B32B** *27/16*

U.S. Cl. 428—141 **7 Claims**



1. A method for texturing the surfaces of a polymer without altering the chemistry of the same comprising the steps of

placing a fluorocarbon polymer in a vacuum environment of about 4×10^{-5} torr,

exposing at least one surface of said fluorocarbon polymer to a neutralized beam of ions having an energy between about 200 eV and 2000 eV and an ion beam current density between 0.5 mA/cm^2 and 1.0 mA/cm^2 to texture the same,

removing said fluorocarbon polymer from said vacuum environment,

casting a polymer over said textured surface of said fluorocarbon polymer and curing the same, and

separating said cast and cured polymer from said fluorocarbon polymer whereby the surface of said polymer has a negative replica of said textured surface of said fluorocarbon polymer.

4,329,386

DECORATIVE LAMINATE

Joseph J. Samowich, 38 Greenwich Ave., Apt. 9D, New York, N.Y. 10014

Filed Dec. 30, 1974, Ser. No. 537,445

Int. Cl.³ B32B *5/18, 5/22, 5/24*

U.S. Cl. 428—196 **36 Claims**

1. A laminate consisting of

a. a transparent plastic surface film of a thermoset emulsion polymer adhered to

b. a crushed, crosslinked thermoset resilient foam of a thermoset emulsion polymer adhered to

c. a textile fabric substrate, with

d. a decorative layer between (a) and (b) the crushed foam layer (b) being self-bonded to the substrate (c) and the surface film.

4,329,387

PREPREG MATERIAL HAVING INCREASED SURFACE TACK

Richard B. Goodrich, Pleasanton, and Richard J. Moulton, Concord, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Division of Ser. No. 909,072, May 24, 1978, Pat. No. 4,213,930. This application Sep. 17, 1979, Ser. No. 75,763

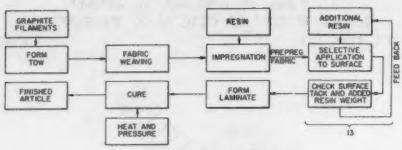
Int. Cl.³ B32B *3/00, 27/14*

U.S. Cl. 428—196 **21 Claims**

1. An article of manufacture adapted to be molded into a resin/filament composite product by placing the article in a mold and applying heat and pressure to the article while in the mold, the product being characterized by a desired amount of resin, the article comprising:

a fabric defined by a multitude of individual high modulus graphite filaments;

an amount of uncured resin impregnating the fabric and being controlled so that it is less than the desired amount of resin in the article, the amount of resin being further such that substantially the entire amount of resin is absorbed into the fabric; and



a multiplicity of discrete quantities of uncured resin applied to at least one surface of the fabric and being spaced apart thereon, the quantities of resin having a relatively high viscosity so that they remain on the surface and render such surface relatively tacky, the quantities of resin being selected so that they represent the difference between the desired amount of resin in the article and the amount of resin impregnating the fabric.

4,329,388

MULTILAYER FILM

Stephen J. Vicik, Darien; William J. Kohler, Westmont, both of Ill., and James O. Funderburk, Jr., Brookfield Center, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 870,137, Jan. 17, 1978, Pat. No. 4,188,350. This application Aug. 27, 1979, Ser. No. 69,867

Int. Cl.³ B65D *33/04;* **B32B** *27/08*

U.S. Cl. 428—216 **17 Claims**

1. A heat shrinkable three-layer film suitable for use in the packaging of frozen poultry, consisting essentially of:

a first outer layer comprising a blend of a propylene-ethylene copolymer having a high isotactic molecular structure, containing up to about 6% by weight ethylene, and having a melt flow of from about 1.5 to about 18 decigrams per minute; a (butene-1)-ethylene copolymer having a high isotactic molecular structure, containing from about 1% to about 10% by weight ethylene, and having a melt flow of from about 0.1 to about 5.0 decigrams per minute; and a thermoplastic elastomer selected from the group consisting of ethylene-propylene copolymers and the ethylene-propylene diene terpolymers, the ratio by weight of said propylene-ethylene copolymers to said (butene-1)-ethylene copolymer being from about 2:1 to about 1:2 and said thermoplastic elastomer being present from about 10% by weight to about 50% by weight;

a core layer capable of being biaxially oriented and heat shrinkable and comprising an extrudable adhesive selected from the group consisting of (a) ionomers, (b) ethylene vinyl acetate copolymers, and (c) mixtures thereof; and

a second outer layer comprising a polymer selected from the group consisting of ethylene homopolymers and copolymers each having a highly branched molecular structure, said film being biaxially oriented.

4,329,389

POLYESTER TEXTILE MATERIALS HAVING IMPROVED DURABLE SOIL RELEASE CHARACTERISTICS AND PROCESS FOR PRODUCING SAME

William C. Kimbrell, Jr., Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 4, 1980, Ser. No. 137,207

Int. Cl.³ B32B *7/00;* **D03D** *3/00;* **B05D** *3/02*

U.S. Cl. 428—263 **12 Claims**

8. A textile material having improved durable soil release and moisture wicking characteristics, which comprises: a textile material substrate formed of polyester fibers having applied thereto a soil release finish in an amount of at least about 0.05 weight percent on a solids basis based upon the weight of the textile material, said soil release finish comprising a sulfonated polyester polymer and at least about 10 percent by weight based upon the weight of the finish of at least one water soluble salt in which the cation moiety of said salt is selected from Mg^{++}, Zn^{++}, and Ca^{++}.

4,329,390

CATIONIC SURFACTANT-CONTAINING AQUEOUS WAX DISPERSIONS, AND THEIR USE AS TEXTILE FINISHING AGENTS

Bernard Danner, Riedisheim, France, assignor to Sandoz Ltd., Basel, Switzerland

Filed Feb. 11, 1980, Ser. No. 120,464

Claims priority, application Switzerland, Feb. 13, 1979, 1401/79

Int. Cl.³ B32B *7/00;* **D03D** *3/00;* **B05D** *3/02*

U.S. Cl. 428—264 **10 Claims**

1. An aqueous dispersion suitable for imparting lubricity to textile substrates comprising an oxidized, microcrystalline wax and, as a dispersing agent, at least one cationic surfactant.

8. A process for the treatment of a textile substrate comprising applying to the substrate an aqueous dispersion of an oxidized microcrystalline wax according to claim 1.

10. Textile substrates whenever treated by the process of claim 8.

4,329,391

SYNTHETIC FIBER SURFACE-MODIFICATION PROCESS

Eugene S. McAlister, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 26, 1980, Ser. No. 191,289

Int. Cl.³ B32B *7/00, 27/00, 27/34;* **B05D** *3/10*

U.S. Cl. 428—265 **30 Claims**

1. A process for providing a shaped essentially synthetic fiber article with a surface-modification to provide said article with stain-release properties, said process comprising the steps:

(1) admixing in an aqueous swelling environment of at least 35° C.

(a) a water-dispellable non-crystalline organic polyester polymer having at least 30 but no more than 70 mole percent of ethylene terephthalate units, a molecular weight of about 700 to 50,000 or more, and one equivalent weight of sulfonic acid or ionizable sulfonic acid salt group per 700 to 800 grams, said polymeric compound being characterized in that it contains substantially equimolar amounts of the residues of

(1) 100 mole percent of dicarboxylic acids consisting essentially of

(a) 0 to 65 mole percent aliphatic dicarboxylic acids having at least two carbon atoms between carbonyl groups and having an average of 4 to 10 carbon atoms,

(b) 30 to 90 mole percent unsulfonated aromatic dicarboxylic acids of which at least 30 but no more than 70 mole percent is terephthalic acid, and

(c) 5 to 60 mole percent of aliphatic or aromatic dicarboxylic acids having 4 to 12 carbon atoms and having one sulfonic acid or sulfonic acid salt group, and

(2) 100 mole percent of glycols consisting essentially of aliphatic glycols containing 2 to 10 carbon atoms and up to 4 non-peroxidic catenary oxygen atoms, of which glycols at least 30 mole percent is ethylene glycol, and

(b) 0.001 to 20% of a water-soluble salt with respect to fiber weight,

(2) contacting said shaped essentially synthetic fiber article with said aqueous environment,

(3) causing swelling of at least the surface of said shaped arti-

cle, while said shaped article is in intimate contact with said water-dispellable non-crystalline polymeric compound and said water-soluble salt, and

(4) isolating said shaped article from said aqueous environment with said polymer locked in and on said synthetic fiber article and remaining there after five washing cycles in an aqueous detergent bath.

28. The shaped essentially synthetic fiber article treated by the process according to claim 1.

4,329,392

MATTING FOR HYDRAULIC ENGINEERING END-USES

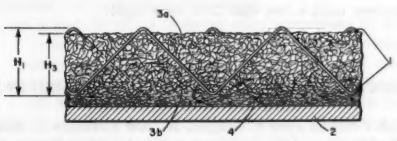
Juergen Bronner, Wuppertal, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jun. 17, 1980, Ser. No. 160,326

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1979, 7917390[U]

Int. Cl.³ B01D *39/00;* E02B *3/14*

U.S. Cl. 428—296 6 Claims



1. A laminate hydraulic engineering matting capable of inhibiting rearrangement of soil particles within said matting comprising a gripper layer of 5–70 mm thickness comprising a plurality of intersecting melt-spun synthetic polymer filaments of a diameter of 0.2 to 1.5 mm and fused at said points of intersection, a filter layer of fine fibers having a thickness of from about 1 to about 10 mm thick, said fine fibers having a denier of less than about 15 dtex, and a third layer comprising fibers interspersed throughout at least 50% of said gripper layer and coincident therewith having individual filament deniers lower than the denier of the fibers of said filter layer.

4,329,393

COATING COMPOSITIONS FOR RETROSPECTIVE IDENTIFICATION OF ARTICLES

James D. LaPerre, River Falls, Wis., and Donald L. O'Brien, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St.Paul, Minn.

Filed May 21, 1980, Ser. No. 151,768

Int. Cl.³ C08K *3/40;* C06B *29/60;* B32B *5/16, 9/00*

U.S. Cl. 428—325 16 Claims

1. A coating composition for retrospective identification of articles comprising a clear lacquer binder containing a plurality of visually-readable microparticles and reflex-reflective glass beads in an amount which does not mask the microparticles.

16. A method of labeling an article for retrospective identification comprising applying to the surface of said article a coating composition according to claim 1.

4,329,394

SURFACE-COATED, UNSIZE-PRESSED CELLULOSIC SHEET AND METHOD FOR MAKING SAME

David E. Hanke, Washougal, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Sep. 9, 1980, Ser. No. 185,477

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—342 14 Claims

1. A uniform, continuous, smooth, surface-coated cellulosic substrate composition, which comprises

(a) an unsize-pressed cellulosic substrate, having a substantial degree of coating hold-out, comprising cellulosic papermaking fibers and at least 25% by weight of cedar fibers; and

(b) a coating composition, which is applied to said substrate, the ratio of the coating weight, in pounds per 3,000 square feet, to the coating thickness, in mils, is from about 5:1, up to about 25:1.

4,329,395

HEAT-BONDABLE LAMINATES OF POLYESTER AND METAL FOIL AND CONTAINERS MADE FROM THEM

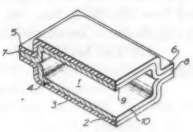
Nigel E. Pickford, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 94,192, Nov. 14, 1979, abandoned. This application May 21, 1980, Ser. No. 151,894

Claims priority, application United Kingdom, Jun. 13, 1979, 7920616

Int. Cl.³ B32B *15/00, 15/08*

U.S. Cl. 428—344 4 Claims



1. A heat-bondable laminate comprising a film of a poly-(ethylene terephthalate) composition directly bonded to one surface of a metal foil whose other surface is bonded to a polyolefin heat-bondable layer in which the heat-bondable layer comprises a copolymer of propylene with from 15 to 30% (by weight of the copolymer) of ethylene wherein at least 65% by weight of the polymerised propylene in the copolymer is present in sequences of homopolymerised propylene and at least 50% of the polymerised ethylene in the copolymer is present in sequences of copolymerised ethylene and propylene.

4,329,396

CORROSION-RESISTANT REFLECTIVE OR TRANSPARENT-REFLECTIVE SHEET MATERIAL

James E. Kropp, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 27, 1980, Ser. No. 153,183

Int. Cl.³ C09U *7/02;* B32B *27/18, 15/08*

U.S. Cl. 428—354 9 Claims

1. Reflective or transparent-reflective sheet material comprising a polymeric foil backing having a thin layer of aluminum bonded to one face, a thin, transparent barrier layer comprising a polymeric material overlying the metal layer and bonded thereto, wherein a nickel organic compound which is an ultraviolet light stabilizer is included in the overlying polymeric material in direction contact with the metal layer.

4,329,397

ELECTRICAL CONDUCTORS COATED WITH POLYESTER IMIDE WIRE ENAMELS

Otto S. Zamek, Schenectady; Denis R. Pauze', Scotia, both of N.Y., and Richard J. Jablonski, Coshoston, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 40,218, May 18, 1979, Pat. No. 4,269,752. This application Feb. 20, 1980, Ser. No. 123,092

Int. Cl.³ B32B *15/02*

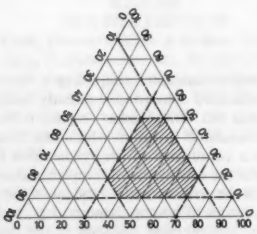
U.S. Cl. 428—379 2 Claims

1. An electrical conductor provided with a continuous coating of the polyesterpolyimide wire enamel obtained by heating ingredients consisting essentially of

(i) an aromatic diamine;

(ii) an aromatic carboxylic anhydride containing at least one additional carboxylic group;
(iii) terephthalic acid or a di (C_1–C_6) alkyl ester, amide or acyl halide thereof;
(iv) a polyhydric alcohol having at least three hydroxyl groups;
(v) an alkylene glycol; and
(vi) an effective amount of 1-phenoxy-2-propanol to reduce molecular weight abatement until reaction therebetween is substantially complete; and a solvent therein comprising predominantly
(i) an alkylene glycol monoether or monoester;
(ii) a polyalkylene glycol monoether or monoester or
(iii) a mixture of (i) and (ii).

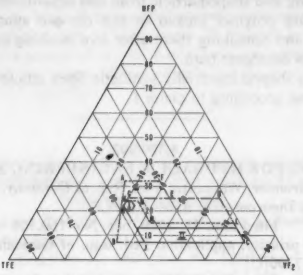
4,329,398
MAGNETIC RECORDING MEDIUM
Akihiko Hosaka, and Kazushi Tanaka, both of Saku, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan
Filed Nov. 19, 1979, Ser. No. 95,648
Claims priority, application Japan, Nov. 24, 1978, 53/144286
Int. Cl.³ G11B *5/68*
U.S. Cl. 428—413 **4 Claims**



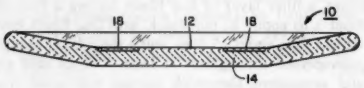
1. A magnetic recording medium consisting of a base coated with a magnetic coating material containing a magnetic powder and a binder composition therefor, characterized in that the binder composition in said magnetic coating material is ternary, consisting of from 30 to 70% of a polyurethane resin having an —OH group in the terminal position, from 10 to 50% of an epoxy resin, and from 10 to 50% of a vinyl chloride-vinylidene chloride copolymer, all by weight on the basis of the total weight of the binder together with a polyisocyanate curing agent.

4,329,399
COATED, HEAT-SEALABLE AROMATIC POLYMER FILM
Isadore Swerlick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 6, 1980, Ser. No. 193,374
Int. Cl.³ B32B *27/00, 27/10*
U.S. Cl. 428—422 **14 Claims**

1. A film having a base layer of an aromatic polymer having a second order transition temperature of at least 200° C. and selected from the group consisting of aromatic polyamide, aromatic polyimide, and aromatic polyparabanic acid, and, on at least one side thereof, a coating comprising a terpolymer consisting of 7 to 32% by weight of hexafluoropropylene units, and 93 to 68% by weight of tetrafluoroethylene units and vinylidene fluoride units, there being at least 12% by weight of said tetrafluoroethylene units and the ratio of said tetrafluoroethylene units to said vinylidene fluoride units being no greater than 5:3, provided that when the content of tetrafluoroethylene units is less than 30% by weight, the content of hexafluoropropylene units is less than 25% by weight.



4,329,400
GLASS ARTICLE HAVING A PATTERN FORMED IN ITS SURFACE AND METHOD
Joseph Ference; John E. Megles, Jr., and Hermann L. Rittler, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Dec. 13, 1979, Ser. No. 103,415
Int. Cl.³ B32B *17/06*
U.S. Cl. 428—426 **5 Claims**



1. An integral vitreous article composed of an opacified interior portion encased within a continuous, unbroken surface layer of a glass which is transparent, except for an opacified zone of predetermined configuration within and extending completely through said glass layer, said article having a uniform elemental, TiO_2-containing composition throughout selected from the group of:
(a) an alkaline aluminosilicate composition of a nepheline or feldspar nature; and
(b) a borosilicate composition; said opacification in said alkaline aluminosilicate composition being caused by the growth of titaniferous particles therein and said opacification in said borosilicate composition being caused by the development of phase separation therein.

4,329,401
METAL COATINGS FROM NITRILE COPOLYMER LATEXES
Herbert Talsma, Cleveland Heights, and William M. Giffen, Jr., Hudson, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 878,975, Feb. 17, 1978, Pat. No. 4,238,535, which is a continuation-in-part of Ser. No. 772,005, Feb. 25, 1977, abandoned, which is a division of Ser. No. 658,842, Feb. 17, 1976, abandoned. This application Mar. 28, 1980, Ser. No. 135,383
The portion of the term of this patent subsequent to Dec. 9, 1997, has been disclaimed.
Int. Cl.³ B32B *15/18;* B05D *3/02;* B32B *15/08*
U.S. Cl. 428—462 **25 Claims**

1. A metal sheet coated on at least one side thereof with a

aqueous latex of a copolymer produced by the polymerization of a major proportion of a monounsaturated nitrile and a minor proportion of another monovinyl monomer component copolymerizable with said nitrile in the presence of a preformed diene rubber.

4,329,402

MICRO-THROWING ALLOY UNDERCOATINGS AND METHOD FOR IMPROVING CORROSION RESISTANCE

Jacob Hyner, Waterbury; Stephen Gradowski, Torrington, and Thomas F. Maestrone, East Hartford, all of Conn., assignors to Whyco Chromium Co., Inc., Thomaston, Conn.

Continuation-in-part of Ser. No. 946,396, Sep. 27, 1978, Pat. No. 4,188,459. This application Sep. 25, 1979, Ser. No. 78,885
The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.
Int. Cl.³ B32B *15/18*
U.S. Cl. 428—621 12 Claims

1. A multi-layer plated article comprising a ferrous metal substrate having thereon a coating for improving the corrosion resistance of said article comprising;

(a) a layer of nickel-cadmium alloy comprising 95 to 99.9% by weight nickel and 0.1 to 5.0% by weight cadmium, said alloy being characterized by the ability to be electrodeposited upon said substrate to form a layer which is thicker inside of surface defects thereon than on the plane surface in which the defect is formed, said layer of nickel-cadmium alloy being applied directly over said substrate and having a thickness which ranges from about 0.005 to 0.00005 inches, and

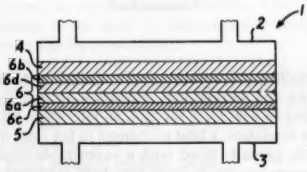
(b) at least one coating which contributes to further improving the corrosion resistance of said ferrous metal substrate, said coating being applied over said layer of nickel-cadmium alloy and being selected from (1) a galvanically protective metal or alloy selected from the group consisting of cadmium and tin, zinc or zinc alloy, (2) alloys of (1), (3) paints, (4) metal dyes, or (5) a chromate film.

4,329,403

ELECTROLYTE-ELECTRODE ASSEMBLY FOR FUEL CELLS

Bernard S. Baker, Brookfield Center, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Apr. 27, 1981, Ser. No. 257,740
Int. Cl.³ H01M *8/14*
U.S. Cl. 429—35 20 Claims



1. An electrolyte-electrode assembly for use in a high-temperature fuel cell comprising:

an anode electrode comprised of a first material;

a cathode electrode comprised of a second material;

an electrolyte member situated between said anode and cathode electrodes and having an inner region and first and second regions on opposite sides of said inner region facing said anode and cathode electrodes, respectively, said first region having a thermal coefficient of expansion between the coefficients of thermal expansion of said anode electrode and said inner region and said second region having a coefficient of thermal expansion between the coefficients of thermal expansion of said cathode electrode and said inner region.

4,329,404

RECHARGEABLE NON-AQUEOUS CELLS WITH COMPLEX ELECTROLYTE SALTS

William L. Bowden, Nashua, N.H.; Donald L. Foster, Somerville; Han C. Kuo, Burlington, both of Mass., and Peter R. Moses, Windham, N.H., assignors to Duracell International Inc.

Filed Sep. 2, 1980, Ser. No. 182,902
Int. Cl.³ H01M *6/14*
U.S. Cl. 429—50 19 Claims

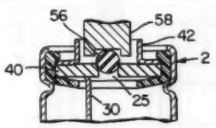
1. A non-aqueous electrochemical cell comprising an anode, a cathode and an electrolyte solution comprised of an electrolyte salt dissolved in an electrolyte solvent characterized in that said electrolyte salt comprises a metal salt complexed with a stoichiometric amount of an ether and wherein said cell is substantially free of said ether which is uncomplexed.

4,329,405

ELECTROCHEMICAL CELL HAVING A SAFETY VENT CLOSURE

Ronald L. Zupancic, Parma Heights, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 26, 1980, Ser. No. 190,990
Int. Cl.³ H01M *2/12*
U.S. Cl. 429—56 11 Claims



1. An electrochemical cell in which the active components of the cell are assembled within a housing comprising a container closed at its open end by a cover, and having at least one vent orifice; the improvement being a safety vent closure comprising a conductive tubular member secured to the housing and surrounding the vent orifice and being open at its top; a deformable member force-fitted within the vent orifice thereby providing a normally fluid tight seal at said vent orifice; and wherein said deformed member is adapted to be at least partially expelled from the vent orifice upon a buildup of a predetermined internal gas pressure inside the cell thereby producing a permanent vent to the atmosphere.

4,329,406

SPECIFIC GRAVITY TRANSDUCER AND BATTERY PERFORMANCE INDICATOR

Ernest A. Dahl, 3247 Breaker Dr., Ventura, Calif. 93003, and George H. Barry, 21225 Saratoga Hills, Saratoga, Calif. 95070

Filed Mar. 27, 1981, Ser. No. 248,639
Int. Cl.³ H01M *10/48*
U.S. Cl. 429—92 18 Claims

1. A battery performance indicator for measuring and monitoring battery conditions, comprising:

a. a specific gravity transducer operable to detect various values of specific gravity of a battery liquid electrolyte across a range of interest when said specific gravity transducer is submersed in the liquid electrolyte;

b. electronic circuit means connected to said specific gravity transducer for converting detection signals from said specific gravity transducer into electrical analog signals representative of the specific gravity of said liquid electrolyte;

c. read-out means electrically connected to said electronic circuit means for indicating the value of the specific grav-

ity of said liquid electrolyte in response to analog signals from said electronic circuit means;

d. said specific gravity transducer, comprising:

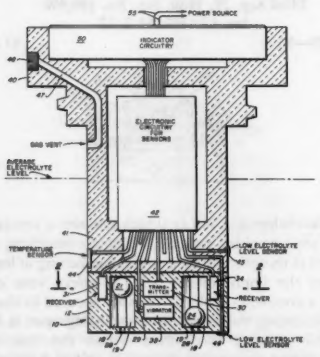
a housing of dielectric material having a plurality of adjacent vertical channels disposed throughout said housing;

passage means for allowing liquid electrolyte flow from outside said housing throughout said housing and said vertical channels and return outside said housing;

each of said vertical channels containing a respective float means; each said respective float means being adapted to float in said liquid electrolyte at a different predetermined specific gravity across a range of interest;

an emitting source located in said housing on one side of said vertical channels; said emitting source being positioned and operable to radiate energy across one end of each of said vertical channels;

a plurality of receiver elements equal in number to the number of vertical channels; one receiver element being positioned on the opposite side of each said vertical channel directly across from said emitting source; each said receiver element being operable to receive radiated energy signals transmitted from said emitting source through said electrolyte and across the respective ends of said vertical channels;



each respective float means when coming between said emitting source and its respective receiver element being operable to attenuate the radiated energy signal from said emitting source that is received by the respective receiver element;

said attenuation by said respective float means of the radiation signals received by respective receiver elements operating to produce detection signals indicative of the specific gravity of the liquid electrolyte within the range of interest; said detection signals being fed to said electronic circuit means and in turn to said read-out means;

e. a power source for providing electrical power to said transducer, said electronic circuitry and said read-out means.

14. A specific gravity transducer, comprising:

a. a housing of dielectric material operable to be immersed in a liquid and having a plurality of adjacent vertical channels disposed throughout said housing;

b. passage means for allowing flow of said liquid from outside said housing throughout said housing and said vertical channels and return outside said housing;

c. each of said vertical channels containing a respective float means; each said respective float means being adapted to float in said liquid at a different predetermined specific gravity across a range of interest;

d. an emitting source located in said housing on one side of said vertical channels; said emitting source being positioned and operable to radiate energy across one end of each of said vertical channels;

e. a plurality of receiver elements equal in number to the number of vertical channels; one receiver element being positioned on the opposite side of each said vertical channel directly across from said emitting source; each said receiver element being operable to receive radiated energy signals transmitted from said emitting source through said liquid and across the respective ends of said vertical channels;

f. each respective float means when coming between said emitting source and its respective receiver element being operable to attenuate the radiated energy signal from said emitting source that is received by the respective receive element;

g. said attenuation by said respective float means of the radiation signals received by respective receiver elements operating to produce detection signals indicative of the specific gravity of the liquid within the range of interest; said detection signals being fed to a read-out means;

h. a power source for providing electrical power to said emitting source and receiver elements and to said read-out means.

4,329,407

ELECTROCHEMICAL STORAGE BATTERY

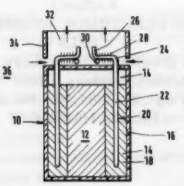
Franz Gross, Neckargemünd, and Hermann Birnbreier, Sandhausen, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Continuation of Ser. No. 35,499, May 3, 1979, abandoned. This application Jun. 25, 1980, Ser. No. 162,745

Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819600

Int. Cl.[3] **H01M** *4/36*

U.S. Cl. 429—101 **9 Claims**



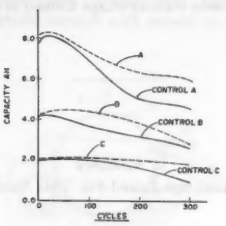
1. Electrochemical storage battery of alkali metal and sulfur with at least one storage cell, insulation around the cell, to minimize loss of heat from the cell, an interspace between the cell and the insulation, a heat exchanger in the form of a closed hollow body partially filled with a vaporizable medium, said heat exchanger having at least two heat exchange zones in open communication, with a first heat exchange zone disposed in the interspace and embedded in a heat storage medium filled in the interspace for preventing overheating of the cell by vaporization of the medium contained therein, and a second heat exchange zone arranged in a heat storage medium, provided in a heat insulated container positioned beside the storage battery to condense vapors of medium which flow from the first heat exchange zone to the second heat exchange zone and also to return heat to the storage battery and prevent cooling during pauses in operation of the battery, and a heater for heating the second heat exchange zone if the temperature of the storage battery is too low, in which case the second zone is heated to effect heat transport from the second zone to the first zone.

4,329,408

LEAD OXIDE COMPOSITION FOR USE IN LEAD-ACID BATTERIES

George W. Mao, St. Paul; Purushothama Rao, Eagan; Frederick L. Marsh, Fridley, and Francis M. Dunlevey, Apple Valley, all of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 2, 1980, Ser. No. 155,251
Int. Cl.[3] H01M 4/20, 4/57
U.S. Cl. 429—228 3 Claims



1. A lead oxide for use in the manufacture of storage battery plates having grids of other than a calcium-lead alloy which comprises a mixture consisting of lead oxide and copper, the copper being present as a dopant for the lead oxide in an amount of from about 0.01 to about 0.07 percent based upon the total weight of said lead oxide.

4,329,409

PROCESS FOR FABRICATING STABLE HOLOGRAMS

John E. Wreede, Monrovia, and Andrejs Graube, Marina Del Rey, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 4, 1980, Ser. No. 175,109
Int. Cl.[3] G03C 5/24, 5/26
U.S. Cl. 430—1 16 Claims

1. In a process for fabricating a hologram which comprises:
(a) forming a layer of a hydrophilic, photosensitive material on at least a portion of a substrate;
(b) exposing the photosensitive layer to an actinic interference pattern to record a latent image thereon;
(c) developing the photosensitive layer to obtain the recorded latent image; and
(d) forming a protective layer on at least a portion of the photosensitive layer, the improvement which comprises depositing on the layer of photosensitive material a protective cover layer including:
(a) a moisture barrier layer less than about 5 μm thick which provides a barrier against diffusion of water vapor such that over the lifetime of the hologram, no more than about 2×10^{-6} g H_2O/cm^2 is transmitted therethrough; and
(b) a hard, abrasion-resistant layer.

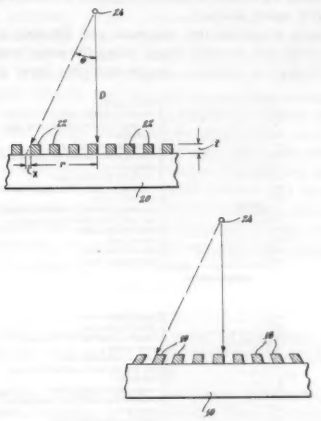
4,329,410

PRODUCTION OF X-RAY LITHOGRAPH MASKS

W. Derek Buckley, Easton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 26, 1979, Ser. No. 107,749
Int. Cl.[3] G03C 5/16; B05D 3/06; G21K 3/00; H05G 1/00
U.S. Cl. 430—5 11 Claims

1. The method of fabricating a mask for use in X-Ray lithography which comprises:
providing a mask membrane of a material substantially transparent to X-radiation;
applying a layer of UV photoresist to said membrane;
applying a thin film of UV-opaque material to said photoresist;
applying a film of electron beam photoresist to said UV-opaque film;
exposing said film of electron beam photoresist to an electron beam to form a selected exposure pattern therein;
developing said electron beam photoresist to remove said exposure pattern and selectively reveal said UV-opaque film;



removing said UV-opaque film where revealed to replicate said exposure pattern therein;
exposing said UV photoresist through said replicated pattern from a point source of radiation at a distance from said membrane substantially equal to the desired distance of the completed mask from an X-Ray source;
developing said UV photoresist where exposed to selectively reveal said membrane in said exposure pattern wherein the UV photoresist remaining after developing defines sloping sidewalls substantially aligned with said radiation point source;
and deposition an X-Radiation absorbing material on the revealed portions of said membrane.

4,329,411

MULTICOLOR DIFFUSION TRANSFER PRODUCTS

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 537,124, Dec. 30, 1974, abandoned.
This application Mar. 21, 1980, Ser. No. 132,424
Int. Cl.[3] G03C 7/00
U.S. Cl. 430—30 3 Claims

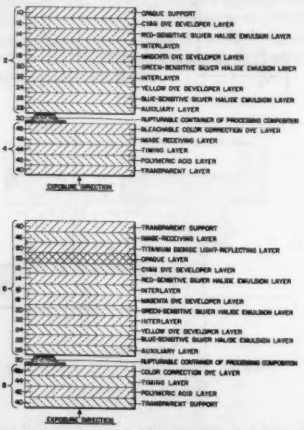
1. The method comprising the steps of:
making a first test exposure of a multicolor photosensitive

element to a multicolor step-wedge, said multicolor photosensitive element comprising a support carrying a red-sensitive silver halide emulsion, a green-sensitive silver halide emulsion, and a blue-sensitive silver halide emulsion, said silver halide emulsions having associated therewith, respectively, a cyan image dye-providing material, a magenta image dye-providing material and a yellow image dye-providing material, said image dye-providing materials being image dyes or image dye intermediates;

forming a first test multicolor diffusion transfer image by diffusion transfer processing of said exposed multicolor photosensitive element;

preparing blue, green and red D log E curves of said first test multicolor diffusion transfer image and determining from said curves the amount of filtration of which wavelength range or ranges would be required to obtain a more desirable color balance;

making a second test exposure and forming a second test multicolor transfer image using the same multicolor photosensitive element, image-receiving layer and diffusion



transfer processing composition under the same exposure conditions as said first test exposure except that said second exposure is effected through a color correction filter or filters of the color and density estimated from said first test exposure to be necessary to provide said filtration necessary to obtain said more desirable color balance;

repeating said second test exposure and forming another test multicolor transfer image with a different color correction filter(s) set until the color correction effective to give the desired D log E curve shape changes is determined;

coating on a transparent non-photosensitive element a color correction layer containing color correction dye or dyes exhibiting the appropriate wavelength range(s) absorption and transmission density to substantially provide said desired color correction;

assembling said multicolor photosensitive element in superposed relationship with said non-photosensitive element into a film unit including a rupturable container releasably retaining an aqueous alkaline processing composition, said pod being positioned to release said processing composition for distribution between the opposed surfaces of said multicolor photosensitive element and said non-photosensitive element, whereby photoexposure of said photosensitive element will be effected through said non-photosensitive element including said color correction layer;

said film unit including an image-receiving layer in one of said elements, said image-receiving layer being viewable through a transparent support for the element containing said image-receiving layer, said film unit including means providing a layer of a white pigment between said image-receiving layer and the silver halide emulsions of said multicolor photosensitive element whereby the image formed in said image-receiving layer may be viewed against a light-reflecting layer provided by said white pigment without separating said elements after photoexposure and processing, said multicolor photosensitive element, image-receiving layer and processing composition being of the same composition as used in said test exposures;

said color correction dye(s) not being visible with the multicolor diffusion transfer image formed in said film unit.

4,329,412

Patent Not Issued For This Number

4,329,413

ELECTROPHOTOGRAPHIC PROCESS CAPABLE OF FORMING OVERLAID IMAGES AND APPARATUS FOR CARRYING OUT THE SAME

Takashi Kitamura, Yokohama, and Michio Ito, Hachioji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 104,706, Dec. 17, 1979. This application Feb. 15, 1980, Ser. No. 121,657

Claims priority, application Japan, Feb. 23, 1979, 54/20255; Feb. 23, 1979, 54/20256

Int. Cl.³ G03G *13/22*

U.S. Cl. 430—54 **8 Claims**

1. A process for forming an overlay latent image comprising the steps of:

applying a first image-forming irradiation onto a photosensitive medium essentially composed of an electrically conductive substrate, a photoconductive layer having substantially no charge injection property, and an electrically insulating layer;

applying a primary electric charge onto the surface of said insulating layer in relation to the change in conductivity of said photoconductive layer caused by said first image-forming irradiation;

applying a corona discharge onto the surface of said insulating layer after applying the primary electric charge; and

applying a second image-forming irradiation on said photosensitive medium thereby forming on the surface of said insulating layer an overlaid latent image from said first and second images.

4,329,414

ELECTROPHOTOGRAPHIC PROCESS

Yoshiro Suzuki, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 936,936, Aug. 25, 1978, abandoned. This application Jul. 24, 1980, Ser. No. 172,847

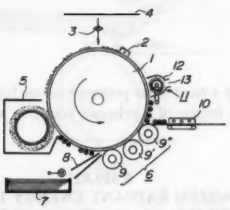
Claims priority, application Japan, Sep. 1, 1977, 52/104157

Int. Cl.³ G03G *13/09, 13/16, 13/22*

U.S. Cl. 430—103 **4 Claims**

1. An electrophotographic process comprising the steps of: introducing into a magnetic brush developing device including an electrically conductive development electrode and magnet

means arranged inside the development electrode, a developer consisting of toners with a volume resistivity higher than $10^{13}\Omega$·cm and magnetic carriers with a volume resistivity of about 10^5 to $10^8\Omega$·cm and having a toner concentration varying from about 7% by weight to about 13% by weight; applying a development bias voltage to said electrically conductive development electrode having applied thereon an electrically insulating coat formed by an aluminum oxide layer of a thickness of 10 to 30 μm with sufficiently high resistivity for preventing any electrostatic charge from being transferred through the magnetic carriers with respect to an electrostatic



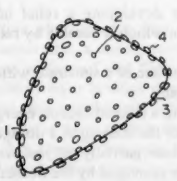
charge retentive member under a high humidity condition; forming an electrostatic charge latent image corresponding to an image of a document to be duplicated on the electrostatic charge retentive member; developing said electrostatic charge latent image by bringing it in contact with a magnetic brush formed by said toners and magnetic carriers on said electrically insulating coat; transferring the developed toner image onto an image receiving member; and repeating said development and transfer steps successively for the electrostatic charge latent image once formed on said electrostatic charge retentive member to form at least twenty duplicated copies.

4,329,415

MAGNETIC DEVELOPER AND PROCESS FOR PREPARATION THEREOF

Toshimitsu Ikeda, Himeji, and Nobuyasu Honda, Tenri, both of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Jan. 30, 1980, Ser. No. 116,886
Claims priority, application Japan, Feb. 7, 1979, 54-12219
Int. Cl.³ G03G *9/14*
U.S. Cl. 430—109 **13 Claims**



1. A composite magnetic developer having a self-friction-chargability, which comprises fixable magnetic particles having a particle size of 5 to 30 microns and comprising (A) fine particles of triiron tetroxide dispersed in (B) a binder medium which shows an adhesiveness under application of heat and pressure, said fixable magnetic particles containing (C) fine particles of triiron tetroxide embedded in the surfaces of said fixable magnetic particles in an amount of 1 to 10% by weight based on said fixable magnetic particles and (D) fine particles of triiron tetroxide adhering to the surfaces of said fixable magnetic particles without being embedded therein in an amount of 1 to 20% by weight based on said fixable magnetic particles.

4,329,416

METHODS FOR PREPARING PLURAL LAYER ORGANIC ELECTROPHOTOGRAPHIC ELEMENTS

Kiyoshi Tanikawa, Yokohama; Masao Yoshikawa, Machida, and Tsutomu Sato, Kawasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1980, Ser. No. 183,919
Claims priority, application Japan, Sep. 12, 1979, 54/116164
Int. Cl.³ G03G *5/07*
U.S. Cl. 430—133 **15 Claims**

1. A method of preparing an electrophotographic element which comprises the steps of: applying onto an electrically conductive substrate, a first overcoating layer of a solution consisting essentially of an organic solvent having dissolved therein a pyrylium dye and an electrically insulating polycarbonate resin containing an alkylidenediarylene group in the recurring units thereof, and then drying said first overcoating layer by evaporating said solvent whereby to form on said substrate a first stratum consisting essentially of a co-crystalline complex of said pyrylium dye and said polycarbonate resin; then, at least once, directly overcoating said first stratum with another overcoating layer of said solution and then drying said another overcoating layer by evaporating said solvent to form another stratum consisting essentially of said complex whereby to obtain a composite photosensitive layer consisting essentially of a plurality of said strata.

4,329,417

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD OF FORMING HIGH CONTRAST SILVER IMAGES

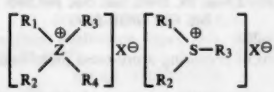
Toshio Nagatani; Takeshi Habu, and Kazuo Takahashi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1980, Ser. No. 158,226
Claims priority, application Japan, Jun. 22, 1979, 54-79537
Int. Cl.³ G03C *5/30, 1/06*
U.S. Cl. 430—264 **10 Claims**

1. A method of forming high contrast silver images which comprises the steps of (1) imagewisely exposing a light-sensitive silver halide photographic material having at least one silver halide emulsion layer coated on a support, said emulsion layer containing

(A) a compound capable of oxidizing said silver halide emulsion selected from the group consisting of alkali metal salts of permanganic acid, alkali metal salts of bichromic acid, alkali metal salts of persulfuric acid, alkali metal salts of hypochloric acid, alkali metal salts of perhalogenoacids, alkali metal salts of halogeno-acids, iron (III) and cobalt (III) complexes of ethylenediaminetetraacetic acid alkali metal salt, hexamminecobalt (III) salts, sodium N-chloroarylsulfonamide compounds and quinone compounds; and

(B) a water-insoluble ion pair formed by linking electrostatically a water-soluble cationic compound with a water-soluble anionic compound, said cationic compound being a compound having formula [I] or [II]:



[I] **[II]**

wherein R_1, R_2, R_3 and R_4 each represent independently a hydrogen atom, an alkyl group, an aryl group or an aralkyl group, or R_3 and R_4 together may form with the atom to which they are attached a pyridine ring, Z represents a

nitrogen atom or a phosphorus atom, and $X^{\ominus}$ represents a counter ion which is water-soluble per se,

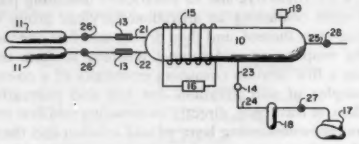
(2) treating said exposed material with a developer containing developing agents of a combination having superadditivity.

4,329,418

ORGANOMETALLIC SEMICONDUCTOR DEVICES

Erich Kny, Vienna, Austria; William J. James; Leonard L. Levenson, both of Rolla, Mo., and Robert A. Auerbach, Pittsburgh, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Nov. 14, 1980, Ser. No. 206,764
Int. Cl.³ B05D *3/06*
U.S. Cl. 430—270 **8 Claims**



1. A semiconductive element consisting essentially of a thin, continuous, solid film consisting essentially of carbon, hydrogen and tin.

4,329,419

POLYMERIC HEAT RESISTANT PHOTOPOLYMERIZABLE COMPOSITION FOR SEMICONDUCTORS AND CAPACITORS

David L. Goff, Springfield; Edward L. Yuan, Philadelphia, both of Pa., and Stephen Proskow, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 3, 1980, Ser. No. 183,648
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—283 **10 Claims**

1. An improved radiation polymerizable composition consisting essentially of

(a) a polyamide ester resin containing photopolymerizable groups;

(b) a solvent for the resin;

(c) radiation sensitive polymerizable polyfunctional acrylate compound and

(d) photopolymerization initiator of an aromatic biimidazole; wherein the polyamide ester resin upon heating converts to a polyimide resin.

4,329,420

PROCESS OF PREPARING PRE-PRESS PROOFS USING PRESSURE SENSITIVE ADHESIVE BACKINGS

Ferdinand L. Bopp, 450 Wicksworth La., St. Louis, Mo. 63122

Filed Sep. 10, 1980, Ser. No. 185,983
Int. Cl.³ G03F *1/00*
U.S. Cl. 430—293 **7 Claims**

1. A process of preparing a pre-press proof comprising the steps of

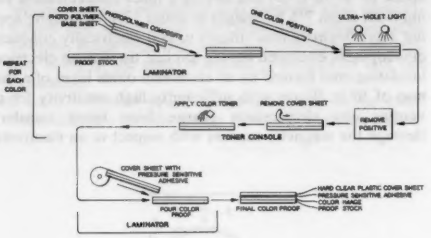
A. applying a photopolymer to a substrate,

B. overlaying a one color separation film having an image thereon to the photopolymer,

C. exposing the photopolymer through the film to harden selected portions of the photopolymer,

D. removing the color separation film,

E. treating the exposed photopolymer to produce the desired image thereon, and



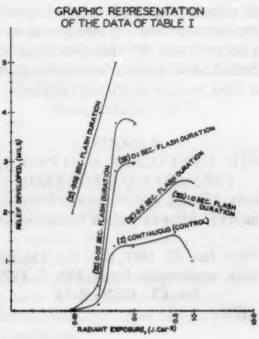
F. applying a hard clear polymer cover layer to the colored proof by means of a pressure sensitive adhesive backing.

4,329,421

USE OF FLASHED RADIANT ENERGY IN PRODUCING RELIEF IMAGES IN RESINOUS COATING

Jerome D. Wisnosky, Lancaster, Pa., and Caroline A. Cauler, Del Rio, Tex., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jan. 7, 1980, Ser. No. 109,773
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—322 **18 Claims**


GRAPHIC REPRESENTATION OF THE DATA OF TABLE I
RELIEF DEVELOPED, (MILS)
RADIANT EXPOSURE, (J./CM.²)
(A) 1/50 SEC. FLASH DURATION
(B) 1/100 SEC. FLASH DURATION
(C) 1/200 SEC. FLASH DURATION
(D) 1/500 SEC. FLASH DURATION
(E) 1/1000 SEC. FLASH DURATION
(F) CONTINUOUS (CONTROL)

1. A method for developing a relief image in a resinous coating composition which is curable by radiant energy which method comprises

(a) coating the surface of a substrate with the resinous coating composition;

(b) exposing, using a flashed radiant energy mode, a portion of the surface of the coating to a dosage of radiant energy effective to at least partially polymerize those areas of the coating that are impinged by the flashed radiation, leaving those areas of the coating that are not impinged by the flashed radiant energy unpolymerized, the flashed radiant energy consisting of flashes of radiant energy impinging the exposed portion of the coating surface, the number of flashes, the flash duration, and the radiant flux density of the flashes serving to increase the amount of relief developed in the coating as compared to the amount of relief developed by exposing the portion of the surface of the coating to the same amount of radiant energy using a continuous radiant energy exposure mode; and,

(c) exposing the entire coating to a dosage of radiant energy effective to completely polymerize the entire coating whereby the resulting coating exhibits a relief image.

4,329,422

POST-EXPOSURE TREATING SOLUTION FOR PHOTOSENSITIVE GRAPHIC ARTS ARTICLES

Eugene L. Langlais, San Diego, Calif., assignor to Napp Systems (USA), Inc., San Marcos, Calif.

Continuation of Ser. No. 875,367, Feb. 6, 1978, abandoned. This application Jun. 25, 1979, Ser. No. 51,478

Int. Cl.[3] G03C 5/24; G03F 7/00

U.S. Cl. 430—331 10 Claims

1. A post-exposure treating solution for photosensitive graphic arts articles comprising:

(a) from 2 to about 50 weight percent of a compound having the formula

where Y is an acid group or a water soluble salt of said acid group and where R is another Y, hydrogen, an aliphatic hydrocarbon; and

(b) about 5 to 60 weight percent of a film forming compound having fewer than 8 carbon atoms and selected from the group comprising the water-soluble mono-ester alkali metal salts of sorbitol phosphate and the alkali metal salts of α and β glycerophosphate; and

(c) sufficient water to make 100 weight percent of solution.

4,329,423

PHOTOGRAPHIC COATED FILM BASES

Cyril J. Ealding, Chester, Va., and Graham Jarrett, Hitchin, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 953,213, Oct. 20, 1978, abandoned. This application Oct. 22, 1980, Ser. No. 199,567

Claims priority, application United Kingdom, Oct. 3, 1977, 40970/77; United Kingdom, Sep. 18, 1978, 37192/78

Int. Cl.[3] G03C 1/78

U.S. Cl. 430—534 17 Claims

1. A light-sensitive photographic film, which comprises a self-supporting plastics film, a copolymeric subbing layer applied to at least one surface of said film and a light-sensitive photographic emulsion layer bonded directly to the copolymeric subbing layer, said copolymeric subbing layer comprising a copolymer prepared from a comonomer mixture consisting essentially of 35 to 55 mole % acrylic acid or a lower alkyl ester thereof in which the alkyl group comprises up to 8 carbon atoms, 35 to 55 mole % methacrylic acid or a lower alkyl ester thereof in which the alkyl group comprises up to 8 carbon atoms, and 1 to 15 mole % of itaconic acid or itaconic anhydride and 0 to 8 mole % of additional monomer selected from the class consisting of acrylamide, methacrylamide, N-methylol acrylamide, N-ethanol acrylamide, N-propanol acrylamide, N-methylol methacrylamide, N-ethanol methacrylamide, N-methyl acrylamide, N-tertiary-butyl acrylamide, acrylonitrile, halo-substituted acrylonitrile, methacrylonitrile, and dimethylaminoethyl methacrylate, and said copolymeric subbing layer having a dry coat weight in the range 0.05 to 3.00 mg/dm^2 and being applied from an aqueous dispersion having a pH in the range 2.0 to 5.0.

4,329,424

MACROSCOPIC METHOD FOR DETERMINING CYTOPATHIC EFFECTS IN VIRAL ASSAY

Roy A. Machlowitz, Glenside; William J. McAleer, Ambler, and William J. Miller, North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 610,501, Sep. 4, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,299

Int. Cl.[3] C12Q 1/70; G01N 1/28, 1/30, 33/54

U.S. Cl. 435—5 7 Claims

1. A method for quantitatively determining cytopathic effect in a cell culture comprising the steps of

adding a series of virus dilutions to a cell suspension in the wells of a multi-well microassay plate,

incubating the resulting infected cell sheets in the presence of an oxygen-CO_2 atmosphere and in the absence of an immobilizing or sealing overlay,

staining the cell sheets at from about 7 to about 10 days after mixing with a protein stain effective to stain and fix the cell sheets substantially immediately whereby the evenly stained areas indicate absence of cytopathic effect and unstained areas indicate presence of cytopathic effect,

exposing the stained cell sheets to a light source, and

scoring each cell sheet for presence or absence of cytopathic effect by inspection for presence or absence of light passing through an unstained area, the inspection being effected without optical magnification and without counting individual foci of infection.

4,329,425

METHOD FOR DETERMINATION OF TRANSAMINASES AND RELATIVE DIAGNOSTIC KIT

Giorgio Ricci, and Giorgio Federici, both of Rome, Italy, assignors to Biodata S.p.A., Italy

Filed Jul. 10, 1980, Ser. No. 168,286

Claims priority, application Italy, Jul. 17, 1979, 49789 A/79

Int. Cl.[3] C12Q 1/52

U.S. Cl. 435—16 4 Claims

1. In a kinetic ultraviolet method for the determination of Glutamic Oxalacetic Transaminase (GOT) and Glutamic Pyruvic Transaminase (GPT) in serum or plasma in which transaminase is reacted with a substrate therefor and determining the reduction in ultraviolet absorbance of a revealing enzyme, the improvement which comprises employing L-cysteinsulfinic acid and L-alanine as the substrates for GOT and GPT, respectively, and using lactic dehydrogenase as the revealing enzyme for both transaminase activities, whereby a simultaneous determination of GOT and GPT in a single sample of serum or plasma can be effected.

4,329,426

PROCESS FOR PREPARATION OF ANTIBIOTICS AND BIOLOGICALLY PURE CULTURE FOR USE THEREIN

Takeo Deushi; Akio Iwasaki; Kazuhiro Kamiya; Toshimi Mizoguchi; Masahito Nakayama, all of Higashimurayama; Hisakatsu Itoh, Kawagoe, and Toshihito Mori, Higashimurayama, all of Japan, assignors to Kowa Company, Ltd., Nagoya, Japan

Division of Ser. No. 56,313, Jul. 10, 1979. This application Jun. 24, 1980, Ser. No. 162,613

Claims priority, application Japan, Jul. 13, 1978, 53-84537; Jun. 6, 1979, 54-69877

Int. Cl.[3] C12P 19/48

U.S. Cl. 435—80 6 Claims

1. A process for producing an antibiotic substance KA-7038, which comprises cultivating an antibiotic substance KA-7038-producing strain belonging to the genus Streptomyces and isolating the antibiotic substance KA-7038 from the resultant culture broth.

4,329,427

FERMENTATIVE PREPARATION OF L-ISOLEUCINE

Mark H. Updike, Baltimore, and Gary J. Calton, Elkridge, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,113
Int. Cl.[3] C12P *13/06*
U.S. Cl. 435—116 9 Claims

1. A process for preparing L-isoleucine which comprises cultivating under aerobic conditions a mutant strain of Brevibacterium thiogenitalis resistant to an analogue of L-isoleucine selected from the group consisting of α-amino-β-hydroxyvaleric acid; methylglycine; gammadehydroisoleucine; 3-cyclopentene-1-glycine; 2-cyclopentene-1-glycine; o-methylthreonine; and β-hydroxyleucine, said cultivation carried out in the presence of a post-threonine biosynthetic precursor of L-isoleucine selected from the group consisting of α-hydroxy butyric acid, α-aceto-α-hydroxy butyric acid, α,β-dihydroxy-β-methylvaleric acid, α-keto butyric acid, and D,L-α-amino-n-butyric acid and alkali metal salts thereof, to yield a fermentation broth, accumulating from about 0.1 to about 6 w/v percent L-isoleucine in said fermentation broth, and recovering the accumulated L-isoleucine from said fermentation broth.

4,329,428

METHANE PRODUCTION FROM AND BENEFICIATION OF ANAEROBIC DIGESTION OF PLANT MATERIAL AND ORGANIC WASTE

Sambhunath Ghosh, Homewood, and Donald L. Klass, Barrington, both of Ill., assignors to United Gas Pipe Line Company, Houston, Tex.

Filed Jan. 31, 1980, Ser. No. 117,374
Int. Cl.[3] C12P *5/02*
U.S. Cl. 435—167 13 Claims

1. In a process of methane production by anaerobic digestion in the presence of acid-forming bacteria and methane-producing organisms at temperatures about 20° to about 70° C. for detention times about 5 to about 30 days, the improvement of obtaining a synergistic yield of methane by digestion of a mixture of plant material and organic waste resulting in production of greater than about 25 percent higher yield of methane than the sum of methane yields produced by separate digestion of said plant material and organic waste under the same conditions consisting essentially of the steps of:

digesting in an active mesophilic or thermophilic anaerobic digestion system in the presence of acid-forming bacteria and methane-producing organisms of a mixture of about 10 to about 90 weight percent on a dry solids basis of organic waste and about 10 to about 90 weight percent on a dry solids basis of plant material which is untreated chemically or physically except for size reduction; and

withdrawing methane-containing gas from said digestion system.

4,329,429

LACTASE PREPARATION

Dennis M. Fenton, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 24, 1980, Ser. No. 133,036
Int. Cl.[3] C12N *9/38*
U.S. Cl. 435—207 18 Claims

1. A process for the release of lactase from lactase-containing yeast cells comprising the steps of (a) contacting said cells with from about 20 weight % to 95 weight % of a compound selected from alkyl alcohols of 1 to 4 carbon atoms and dialkyl ketones having from 1 to 4 carbon atoms in each alkyl group, based on the total weight of said cells and said compound, at a temperature from 5° C. to 35° C., and then (b) contacting said cells with an aqueous solution having a pH from about 5.5 to 8.0 at a temperature from about 5° C. to 35° C. and separating the cells from the resulting lactase-containing solution.

14. A process for selectively reducing protease activity from a protease-containing lactase preparation comprising heating an aqueous solution containing said preparation and from about 30 to 90 weight percent glycerol, based on the total weight of said solution, at a temperature from about 35° C. to about 60° C. at a pH from about 5.5 to 8 until said protease activity is substantially reduced.

4,329,430

ENZYME MIXTURE

Gerold K. V. Klein, Merepoint Rd., Brunswick, Me. 04011, and John C. Houck, 4020 28th Pl., Seattle, Wash. 98199

Continuation-in-part of Ser. No. 45,109, Jun. 4, 1979, Pat. No. 4,226,854, which is a division of Ser. No. 887,607, Mar. 17, 1978, Pat. No. 4,197,291, which is a continuation of Ser. No. 678,695, Apr. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 489,254, Jul. 17, 1974, abandoned, which is a continuation of Ser. No. 431,622, Jan. 8, 1974, abandoned. This application Apr. 23, 1980, Ser. No. 143,007
The portion of the term of this patent subsequent to Apr. 8, 1997, has been disclaimed.
Int. Cl.[3] C12N *9/50*; A61K *37/54*
U.S. Cl. 435—219 1 Claim

1. A heat labile, water soluble proteolytic enzyme mixture obtainable from bromelain which, when activated by moisture and in contact with devitalized tissue of a mammalian host, will effect debridement of said devitalized tissue, said mixture containing escharase, a hydrolytic enzyme material free of caseinolytic activity with an isoelectric point of about 6, comprised of at least two subunits each of which has a molecular weight from about 14,300 to 15,000 daltons, all of the components of the mixture having a molecular weight of from about 30,000 to 50,000 daltons.

4,329,431

INSTANT CULTURE MEDIA AND METHOD OF STERILIZING SAME

Kamal A. Youssef, P.O. Box 6548, West Palm Beach, Fla. 33405

Continuation-in-part of Ser. No. 913,584, Jun. 8, 1978, Pat. No. 4,248,971. This application Oct. 14, 1980, Ser. No. 196,929
Int. Cl.[3] C12N *1/20*
U.S. Cl. 435—253 10 Claims

1. A culture medium comprising in weight percent:

about 0.00 to 5% of a gelling agent;

about 0.015 to 0.03% of a bleaching agent having germicidal and biocidal properties and containing at least one halogen or halogen-liberating compound capable of providing a final halogen concentration in water of about 50 to 100 parts per million;

about 0.22 to 0.06% of a halogen-inactivating agent having at least one thio, mercapto or sulfhydril group

about 7 to 50% of a nutrient; balance, water.

4,329,432

MYCOBACTERIUM FORTUITUM STRAIN

John C. Knight, and Merle G. Wovcha, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 877,230, Feb. 13, 1978, Pat. No. 4,304,860, which is a continuation-in-part of Ser. No. 767,369, Feb. 10, 1977, abandoned, which is a division of Ser. No. 632,650, Nov. 17, 1975, Pat. No. 4,042,459. This application Aug. 28, 1980, Ser. No. 182,152
Int. Cl.[3] C12N *1/20*
U.S. Cl. 435—253 1 Claim

1. A biologically pure culture of mutant *Mycobacterium fortuitum* NRRL B-8128.

4,329,433

PROCESS FOR CONTINUOUS FERMENTATION

Dietrich Seebeck, Meerbusch; Jens A. Schildmann, Partenheim; Reinhard Weisrock, Neider-Olm, and Julius Koch, Eltville, all of Fed. Rep. of Germany, assignors to Peter Eckes, Nieder-Olm, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 960,893, Nov. 15, 1978, Pat. No. 4,233,407, Continuation-in-part of Ser. No. 957,585, Nov. 3, 1978, abandoned, Continuation-in-part of Ser. No. 876,822, Feb. 10, 1978, abandoned. This application Mar. 7, 1980, Ser. No. 128,336

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706831

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.[3] **C12C** *11/14;* **C12G** *1/00;* **C12N** *1/18;* **C12M** *1/12*

U.S. Cl. 435—255 **5 Claims**

1. A process for the continuous fermentation of fermentable solutions with yeast to produce fermentation products in a closed upright slender fermentation tower having a hollow interior, a lower end, and an enlarged upper end section, comprising the steps:

(a) sterilizing the tower by introducing into the upper and lower ends of the tower and through steam inlet means provided along the length thereof, a stream of steam;

(b) introducing sterilized gas into the upper end of the tower through a sterile gas inlet fitted with a membrane filter and exhausting the sterilized gas through a gas exhaust fitted with a membrane filter and pressure regulating means to maintain a positive pressure of sterilized gas therein to restrain the entrance of contaminants into the tower;

(c) continuously introducing a fermentable solution into the lower end of the tower;

(d) fermenting the fermentable solution while agitating the fermentable solution by continuously introducing a stream of bubbles of sterile gas into the lower end of the tower through a sintered candle device;

(e) periodically removing samples of the fermentation mixture to monitor the fermentation reaction and thereafter supplying steam to the sampling means to maintain its sterility;

(f) continuously removing the fermentation products from the enlarged upper end section of the tower;

(g) separating yeast cells from the products removed from the tower and reintroducing the yeast cells into the lower end of the tower.

4,329,434

NOVEL FLUORINATED CATION EXCHANGE MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Kyoji Kimoto, Tokohama; Hirotsugu Miyauchi, Tokyo; Jukichi Ohmura, Yokohama; Mikio Ebisawa, Hiratsuka, and Toshioki Hane, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

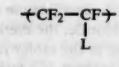
Filed May 23, 1980, Ser. No. 152,847

Claims priority, application Japan, May 31, 1979, 54/67888; May 31, 1979, 54/67889; Jul. 9, 1979, 54/85852; Jul. 18, 1979, 54/90301; Jul. 18, 1979, 54/90302

Int. Cl.[3] **B01J** *39/00*

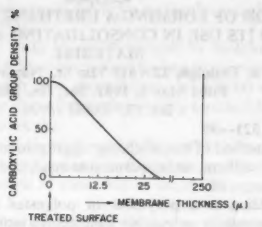
U.S. Cl. 521—27 **30 Claims**

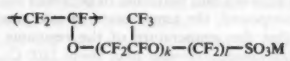
1. A fluorinated cation exchange membrane, comprising essentially the following recurring units (C), (D) and (E):



(C)

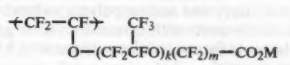
wherein L is F, Cl, CF_3, OR_F or H, R_F being C_1–C_5 perfluoroalkyl,





(D)

wherein K is 0 or 1, l is an integer of 3 to 5, M is H or a metal or ammonium ion,



(E)

wherein k and M are the same as defined above and m is equal to (l − 1), and having a carboxylic acid group density of at least 20% on one surface of the membrane, said carboxylic acid group density being gradually decreased from said one surface of the membrane toward the innerside of the membrane.

4,329,435

NOVEL FLUORINATED COPOLYMER WITH TRIDIHYDRO FLUOROSULFONYL FLUORIDE PENDANT GROUPS AND PREPARATION THEREOF

Kyoji Kimoto, Yokohama; Hirotsugu Miyauchi, Tokyo; Jukichi Ohmura, Yokohama; Mikio Ebisawa, Hiratsuka, and Toshioki Hane, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

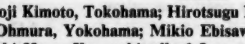
Filed May 23, 1980, Ser. No. 152,856

Claims priority, application Japan, May 31, 1979, 54-67889; Jul. 18, 1979, 54-90302; Dec. 21, 1979, 54-165675; Dec. 26, 1979, 54-168179; Dec. 28, 1979, 54-170315

Int. Cl.[3] **B01J** *47/12*

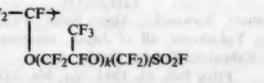
U.S. Cl. 521—38 **28 Claims**

1. A fluorinated copolymer, consisting essentially of the following recurring units (A) and (B):



(A)

wherein each of A_1 and A_2 is F or H; A_3 is F, Cl or H; and A_4 is F, Cl, CF_3, $—OR_F$ or CH_3, R_F being C_1–C_5 perfluoroalkyl,



(B)

wherein k is 0 or 1, l is an integer of 3 to 5, the molar ratio of units (A) (B) being from 1 to 16, said copolymer being substantially a random copolymer having a molecular weight generally in the range from 8,000 to 1,000,000 and having a melt index generally in the range from 0.001 g/10 min. to 500 g/10 min., as measured by the use of an orifice of 2.1 mm in diameter and 8 mm in length, under a load of 2.16 kg at 250° C.

4,329,436

METHOD OF FORMING A URETHANE PREPOLYMER AND ITS USE IN CONSOLIDATING AGGREGATE MATERIAL

Richard R. Dedolph, 22W510 71st St., Naperville, Ill. 60540

Filed May 8, 1981, Ser. No. 262,204
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—99 18 Claims

1. A method of consolidating aggregate material to form an integral, resilient, water-permeable mass, said method comprising the steps of:

(a) adding to a polyether or polyester compound under substantially anhydrous conditions a stoichiometric excess of a compound containing at least two active isocyanate groups per molecule to initiate an exothermic condensation reaction between said polyether or polyester and said isocyanate compound, the temperature of said reactants being such that the temperature of the reactants after addition of isocyanate is greater than about 120° C.;

(b) allowing said reaction to proceed in order to form a hydrophilic urethane prepolymer;

(c) forming an aqueous slurry of unconsolidated aggregate material; and,

(d) combining said slurry and said prepolymer whereby the water in said slurry reacts with excess isocyanate groups in said prepolymer to form a cellular polymer which binds said aggregate material.

4,329,437

PROCESS FOR THE PRODUCTION OF BROKEN DOWN LIGNIN-CELLULOSE SILICATE COPOLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 203,730, Nov. 3, 1980, Pat. No. 4,281,110, which is a continuation-in-part of Ser. No. 112,290, Jan. 15, 1980, Pat. No. 4,243,757, which is a continuation-in-part of Ser. No. 29,202, Apr. 12, 1979, Pat. No. 4,220,757. This application Apr. 24, 1981, Ser. No. 257,240
Int. Cl.[3] C08J *9/00*
U.S. Cl. 521—100 12 Claims

1. The process for the production of polyurethane silicate foam by the following steps:

(a) mixing and reacting a broken down alkali metal lignin cellulose silicate polymer and a substituted organic compound having at least two carbon atoms, each of which is attached to a substituent which will split off during the reaction, to said broken down alkali metal lignin-cellulose polymer in the amount wherein the mols of the substituent radicals are about equal to the mols of the alkali radicals in the mixture thereby producing a broken down lignin-cellulose copolymer;

(b) mixing and reacting 1 to 95 parts by weight of the broken down lignin-cellulose copolymer, up to 50% by weight of a curing agent, percentage brsed on the weight of the reactants, and 50 parts by weight of a polyisocyanate or a polyisothiocyanate thereby producing a polyurethane silicate foam.

4,329,438

THERMOSETTING UNSATURATED POLYESTER RESIN COMPOSITION AND METHOD FOR PREPARATION THEREOF

Akio Yamori, Kawasaki; Akira Saito, Fujisawa, and Hideo Morita, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 11, 1981, Ser. No. 233,502
Claims priority, application Japan, Feb. 15, 1980, 55/16567; Feb. 15, 1980, 55/16568
Int. Cl.[3] C08L *67/06, 53/02*
U.S. Cl. 525—64 29 Claims

1. A thermosetting unsaturated polyester resin composition comprising:

(a) an unsaturated polyester,

(b) a modified block copolymer comprising a block copolymer of vinyl aromatic compound and conjugated diene compound onto which more than one molecule of an unsaturated dicarboxylic acid and/or unsaturated dicarboxylic acid derivative is grafted,

(c) a vinyl monomer,

(d) a curing agent, and

(e) optionally, other additives.

4,329,439

PROCESS FOR POLYMERIZING DIENES

Delmar F. Lohr, Jr., Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 153,477, May 27, 1980, Pat. No. 4,280,927. This application Apr. 2, 1981, Ser. No. 250,348
Int. Cl.[3] C08F *136/04, 136/06, 136/08, 4/48*
U.S. Cl. 525—180 12 Claims

1. A process for the liquid phase polymerization of a conjugated diene having 4–10 carbon atoms at a temperature of −20° to 150° C. while in intimate contact with a polymerization catalyst, the proportion of said catalyst being in the range of 0.15–20 millimoles of the organo-metal component for 100 grams of said diene, said catalyst comprising (a) an R″Li organometal compound in which R″ is a monovalent hydrocarbyl radical of 1 to 20 carbon atoms, and (b) an amino-acetal compound of the formula $R'_2N—A—CH(OR)_2$ wherein R and R′ each represents a saturated aliphatic hydrocarbyl group of 1–3 carbon atoms; A represents a divalent saturated aliphatic hydrocarbon group of 1–10 carbon atoms having 1–3 carbon atoms in direct linkage between said two valencies, the proportion of said amino-acetal compound being 0.25–10 moles per mole of said organo-metal compound.

4,329,440

PROCESS FOR PRODUCING HIGHLY CRYSTALLINE α-OLEFINIC POLYMER

Toshiyuki Kokubo, and Takashi Yamao, both of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 670,069, Mar. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 539,602, Jan. 8, 1975, abandoned. This application Aug. 21, 1979, Ser. No. 68,481
Claims priority, application Japan, Jan. 10, 1974, 49-6372; Nov. 11, 1974, 49-130355
Int. Cl.[3] C08F *4/64, 10/06*
U.S. Cl. 526—142 3 Claims

1. In a process for producing a highly crystalline α-olefinic polymer by slurry polymerization, which comprises polymerizing propylene or a mixture of propylene and ethylene or butene-1 at a temperature of 50° to 90° C. and a pressure ranging from atmospheric pressure to 110 kg/cm^2 in the presence of a catalyst system having two components consisting essentially of (1) titanium trichloride, and titanium trichloride being obtained by reducing titanium tetrachloride with aluminum and pulverizing the resulting titanium trichloride, and (2) diethylaluminum chloride, the improvement comprising adding to said catalyst system a lactone selected from the group consisting of γ-butyrolactone, γ-caprolactone, ε-caprolactone and β-propiolactone, wherein the titanium trichloride, the diethylaluminum chloride and the lactone are used in the molar ratio of 1:2-10:0.01-1, respectively, whereby the amount of heptane-insoluble polymer is increased without lowering the polymerization rate and bulk density thereof.

4,329,441

PROCESS FOR THE POLYMERIZATION OF ALLYL AMMONIUM SALTS AND THE RESULTING PRODUCTS

Peter Bergthaller, Cologne, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

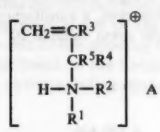
Filed Nov. 12, 1980, Ser. No. 206,154

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946550

Int. Cl.[3] C08F *26/02*

U.S. Cl. 526—193 10 Claims

1. A process for the polymerisation of allyl ammonium salts, wherein a compound corresponding to the following formula



(I)

in which

R^1 and R^2 which may be the same or different and represent hydrogen; an aliphatic, araliphatic or cycloaliphatic radical which may be substituted or R^1 and R^2 may together represent the atoms required to complete a 5- to 7-membered heterocyclic group;

R^3 to R^5 which may be the same or different, represent hydrogen or an alkyl radical which may be substituted,

A is an anion and/or

R^3 represents the radical

$$(-CR^5R^4-NR^1R^2H)^+A^-$$

is polymerised in the presence of a phosphorus compound corresponding to the following formula

(II)

in which

R^{20} and R^{21} which may be the same or different, represent hydrogen; an alkyl group which may be substituted; an aryl group which may be substituted;

hydroxyl; alkoxy; aralkyl; aralkoxy; dialkylamino; or R^{20} and R^{21} represent the group —O—R^{23}—O— where R^{23} is an alkyl radical which may be substituted containing no more than 6 carbon atoms, R^{22} represents hydrogen; an acyl group which may be substituted; alkyl; dialkylamino;

X represents a single electron pair or an oxygen atom,

X represents a single electron pair when none of the substituents R^{20} to R^{22} represents hydrogen.

4,329,442

HIGH ADHESION PLUGGING AND ENCAPSULATING POLYURETHANE PREPARED FROM A POLYOL, A TRI OR TETRA FUNCTIONAL ALIPHATIC POLYOL AND A MONOFUNCTIONAL ALIPHATIC ALCOHOL

Richard J. Pokorny, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1981, Ser. No. 234,568

Int. Cl.[3] C08G *18/30*

U.S. Cl. 528—49 17 Claims

1. A dielectric, thermally stable, hydrolytically stable, moisture-insensitive polyurethane resin comprising the reaction product of an admixture of:

(a) from about 15 to about 45 percent by weight of said admixture of at least one isocyanate compound having at least about 2.0 NCO groups per molecule and selected from the group consisting of aliphatic and cycloaliphatic isocyanate compounds having a molecular weight of less than about 1,000;

(b) from about 30 to about 70 percent by weight of said admixture of at least one polyol having an average molecular weight of at least about 500 to about 3,000 and containing at least about 2.0 predominantly terminal hydroxyl groups per molecule;

(c) from about 5 to about 20 percent by weight of said admixture of a tri or tetra functional aliphatic polyol having a molecular weight of about 100 to about 700;

(d) from about 3 to about 30 percent of a monofunctional aliphatic alcohol having 3 to 100 carbon atoms; and

(e) up to about 5 percent by weight of said admixture of at least one catalyst capable of promoting a reaction between said isocyanate compound and said polyol and monofunctional alcohol compounds;

wherein said isocyanate compound is present in sufficient quantity to provide an NCO/OH ratio of from about 0.9 to 1.1 in said admixture.

4,329,443

PROCESS FOR POLYESTER-CARBONATE TRANSESTERIFICATIONS

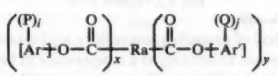
Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 23, 1980, Ser. No. 143,804

Int. Cl.[3] C08G *63/64*

U.S. Cl. 528—180 7 Claims

1. A process for effecting a polyester-carbonate transesterification which comprises reacting a bis(ortho-haloaryl) ester of the formula



with a bis(ortho-haloaryl)carbonate and a dihydric phenol under transesterification reaction conditions where Ra represents an aromatic ring, both x and y individually represent whole numbers of at least 1 up to the maximum equivalent to the number of replaceable hydrogen atoms or other groups substituted for on an aromatic ring comprising Ra, independently at least a P or Q substituent is an ortho-positioned halogen or a trifluoromethyl group directly bonded to an aromatic ring carbon atom located adjacent to an oxy group of an ester group, at least one of i or j represents a whole number of at least 1 up to a maximum equivalent to the number of replaceable hydrogen atoms or other groups substituted for on aromatic rings comprising Ar and Ar'.

4,329,444

PRODUCTION OF POLYESTERS

Willem F. H. Borman, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 96,297, Nov. 21, 1979, abandoned, which is a continuation of Ser. No. 814,081, Jul. 8, 1977, abandoned, which is a continuation of Ser. No. 335,441, Feb. 26, 1973, abandoned. This application Dec. 1, 1980, Ser. No. 211,656

Int. Cl.[3] C08G *63/18*

U.S. Cl. 528—272 15 Claims

1. A process for the preparation of a high molecular weight, linear poly(1,4-butylene terephthalate) resin, said process comprising:

(a) heating 1,4-butanediol to a temperature in the range of from about 175° to about 275° C.;

(b) gradually adding terephthalic acid to the hot 1,4-butanediol; an

(c) removing the byproduct water from the reaction mixture as the water is formed.

4,329,445

PROCESS FOR PREPARING A TETRAHYDROFURAN-ALKYLENE OXIDE COPOLYMER WITH TREATED BENTONITE CATALYST

Thomas W. Del Pesco, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 34,604, Apr. 30, 1979, Pat. No. 4,235,751. This application May 30, 1980, Ser. No. 154,844

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.[3] C08G *65/20*

U.S. Cl. 528—416 5 Claims

1. In a process for catalytically preparing a tetrahydrofuran-/alkylene oxide polymer, the improvement comprising using as the catalyst a material prepared by

(a) holding a raw granular Wyoming bentonite at a temperature of about 300°–600° C. for about 1–20 hours, in air;

(b) impregnating the product of (a) with an organic liquid capable of being intercalated into said product;

(c) activating the product of (b) with hydrochloric acid, nitric acid, sulfuric acid or phosphoric acid;

(d) removing residual acid from the product of (c); and then

(e) washing the product of (d) with water until it is substantially free of acid anions.

4,329,446

METHOD OF PREPARING CELLULOSE ESTERS

Brice S. Wininger, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1980, Ser. No. 182,515

Int. Cl.[3] C08B *3/06*

U.S. Cl. 536—69 6 Claims

1. A method of preparing lower fatty acid esters of cellulose which comprises esterifying at a temperature of between about 75° C. and about 110° C. a cellulose compound having esterifiable hydroxyl groups with an esterifying bath comprising an organic acid anhydride, a diluent, and from about 0.3% to about 3.0% by weight, based on the weight of cellulose, of a catalyst selected from the group consisting of p-toluene sulfonic acid, methane sulfonic acid, methane disulfonic acid and m-benzene disulfonic acid, the weight ratio of said bath to the cellulose being between about 5:1 to about 10:1.

4,329,447

CATALYST FOR AND METHOD OF PREPARING CELLULOSE ESTERS

Richard J. Brewer, and Brice S. Wininger, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1980, Ser. No. 182,521

Int. Cl.[3] C08B *3/06*

U.S. Cl. 536—69 6 Claims

1. A method of preparing lower fatty acid esters of cellulose which comprises esterifying at a temperature of between about 75° C. and about 110° C. a cellulose compound having esterifiable hydroxyl groups with an esterifying bath comprising an organic acid anhydride, a diluent, and a catalyst comprising (a) from about 0.3 to about 3.0% by weight, based on the weight of cellulose, of an acid selected from the group consisting of sulfuric acid, p-toluene sulfonic acid, methane sulfonic acid, methane disulfonic acid and m-benzene disulfonic acid, and (b) from about 0.05 to about 0.3% by weight, based on the weight of cellulose, of a dialkyl phosphite, the alkyl groups of which contain from 2 to 4 carbon atoms, the weight ratio of said bath to the cellulose being between about 5:1 and about 10:1.

4,329,448

MICROBIAL HETEROPOLYSACCHARIDE

Roger B. Cox, Reading, and David C. Steer, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,220

Claims priority, application United Kingdom, Jul. 10, 1979, 7924040; Dec. 20, 1979, 7943878

Int. Cl.[3] C08B *37/00*

U.S. Cl. 536—123 6 Claims

1. Biopolymer PS 87, a heteropolysaccharide which comprises from 40 to 45% by weight of glucose, from 10 to 20% by weight galactose, from 25 to 30% by weight mannose, from 6 to 13% by weight glucuronic acid and from 0 to 1.5% by weight fucose, a 1% by weight solution of Biopolymer PS 87 having pseudoplastic properties, a consistency at 20° C. of at least 150 poise and a yield stress value at 20° C. of at least 30 dynes/cm^2.

4,329,449

METHOD OF USING RECYCLED MOTHER LIQUORS TO PRODUCE ALDOSIDES

Claris D. Roth; Kenneth B. Moser, and William A. Bomball, all of Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 938,750, Sep. 1, 1978, Pat. No. 4,223,129. This application Mar. 3, 1980, Ser. No. 126,257

Int. Cl.[3] C07H *1/00*

U.S. Cl. 536—18.6 17 Claims

1. A method for directly converting monohydric alcohols and carbohydrates into aldoside mixtures and recovering therefrom at least one hydrocarbyl aldoside, said process comprising the steps of:

(a) providing to a tubular reaction zone under a positive fluid pressure, a fluid slurry comprised of mother liquor, carbohydrate, monohydric alcohol and catalyst in an amount sufficient to permit chemical conversion of the fluid slurry into a fluid hydrocarbyl aldoside mixture;

(b) heating said feed slurry within said continuous tubular reaction zone to an elevated temperature for a period of time sufficient to convert said fluid slurry into a fluid hydrocarbyl aldoside mixture while continuously providing additional feed slurry to said tubular reaction zone under a positive fluid pressure to force the converted fluid aldoside mixture through said tubular reaction zone;

(c) partitioning the fluid hydrocarbyl aldoside mixture into a mother liquor and aldoside by selectively removing at least a portion of one hydrocarbyl aldoside from the fluid hydrocarbyl aldoside mixture;

(d) recovering the partitioned aldoside therefrom and recycling the mother liquor to the feed slurry of step (a) above.

4,329,450

NOGALAMYCIN ANALOG CONTAINING COMPOUNDS

Paul F. Wiley, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 25, 1981, Ser. No. 238,262

Int. Cl.[3] A61K *31/71*; C07H *15/24*

U.S. Cl. 536—6.4 7 Claims

1. 2',4'-Diacyl derivative of nogalamycin and its analogs selected from the group consisting of nogalarol, nogalarene, o-methylnogalarol, disnogamycin, nogalamycinic acid, 7-con-O-alkylnogarol, and 7-dis-O-alkylnogarol which retain the dimethylamino moiety, said acyl group consists of hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive; halo-, nitro-, amino-, cyano-, and lower alkoxy-substituted hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive.

4,329,451

PREPARING AN AQUEOUS DISPERSION OF COLLOIDAL SIZE PARTICLES OF A WATER-INSOLUBLE POLYSACCHARIDE DERIVATIVE

Maurice L. Zweigle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 3, 1980, Ser. No. 202,915
Int. Cl.[3] C08B *3/22*
U.S. Cl. 536—77 11 Claims

1. A method for comminuting a water-insoluble, polysaccharide derivative, said method comprising grinding the water-insoluble, polysaccharide derivative in the presence of sufficient amounts of an aqueous grinding medium to form an aqueous dispersion of the polysaccharide derivative and at conditions such that the polysaccharide derivative is ground to a number average particle size of less than about 10 microns, wherein said amount of the grinding medium is at least about 20 weight percent based on the weight of the polysaccharide derivative and aqueous grinding medium.

4,329,452

IMMUNOTHERAPEUTIC AGENT FOR TUMORS COMPRISING LIPOPOLYSACCHARIDE AS AN ACTIVE COMPONENT

Chisato Maruyama, No. 20-6, 1-chome, Mukogaoka, Bunkyo-ku, Tokyo-to, Japan

Filed May 6, 1980, Ser. No. 147,127
Claims priority, application Japan, Jul. 4, 1979, 54-84681
Int. Cl.[3] C08B *37/00;* A61K *31/72;* C07H *13/02*
U.S. Cl. 536—119 5 Claims

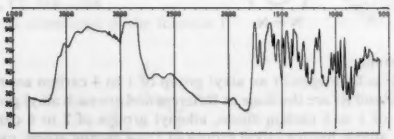
1. An immunotherapeutic agent for tumors, which comprises as an effective component lipopolysaccharide comprising, arabinomannan as a polysaccharide and fatty acids bonded to said arabinomannan through an ester linkage, the fatty acid content in said lipopolysaccharide being 1 to 28%, said lipopolysaccharide being obtained by hot water extraction and purification of cell body of human tubercle bacillus, *Mycobacterium tubercurosis* strain Aoyama B or *Mycobacterium tubercurosis* strain $H_{37}R_v$.

4,329,453

CEPHALOSPORIN ANTIBIOTIC

Alastair C. Brodie, Ickenham, and Lewis A. Wetherill, North Wembley, both of England, assignors to Glaxo Group Limited, London, England

Filed Sep. 9, 1980, Ser. No. 185,883
Claims priority, application United Kingdom, Oct. 2, 1979, 34204/79
Int. Cl.[3] C07D *501/46*
U.S. Cl. 544—25 1 Claim



1. (6R,7R)-7-[(Z)-2-(2-Aminothiazol-4-yl)-2-(2-carboxyprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)ceph-3-em-4-carboxylate pentahydrate.

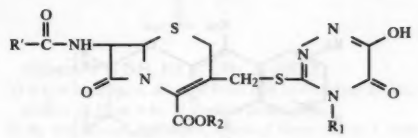
4,329,454

CEPHALOSPORIN COMPOUNDS

William H. W. Lunn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 651,083, Jan. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 583,924, Jun. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 494,148, Aug. 2, 1974, abandoned. This application Jul. 12, 1977, Ser. No. 814,830
Int. Cl.[3] C07D *501/36*
U.S. Cl. 544—026 14 Claims

1. A compound of the formula



wherein

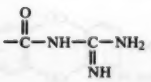
R_1 is hydrogen or lower alkyl;

R_2 is hydrogen, an alkali metal cation, or a readily removable ester-forming group;

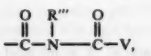
R′ is a group of the formula

wherein P is 2-thienyl, 3-thienyl, 1-tetrazyl, or a phenyl group of the formula

in which a and a′ independently are hydrogen, C_1–C_4 lower alkyl, C_1–C_4 lower alkoxy, halogen, hydroxy, or aminomethyl; Y is



or



wherein R‴ is hydrogen or C_1–C_3 alkyl, and V is phenyl, halophenyl, furyl, mono- or di(C_1–C_3 alkyl)amino, mono- or diphenylamino, or R‴ and V taken together form a heterocycle wherein R‴ is $—(CH_2)_n—$ in which n is 2 or 3, and V is —NR⁗, in which R⁗ is hydrogen, methanesulfonyl, or C_1–C_3 alkyl.

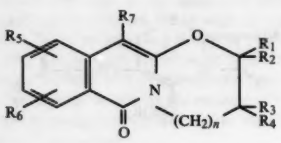
4,329,455

1,3-OXAZINO(3,2-b)ISOQUINOLINE-6-ONES

Kazuo Kubo, Urawa; Noriki Ito, Iwatsuki; Isao Souzu, Urawa; Yasuo Isomura, Yokohama, and Hiroshige Homma, Omiya, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 29,000, Apr. 11, 1979, abandoned, which is a division of Ser. No. 861,980, Dec. 19, 1977, Pat. No. 4,163,844.
This application Jan. 14, 1981, Ser. No. 224,968
Claims priority, application Japan, Dec. 28, 1976, 51-157867; Oct. 11, 1977, 52-121666
Int. Cl.³ C07D *498/04*
U.S. Cl. 544—89 4 Claims

1. Nitrogen-containing heterocyclic compounds represented by the formula



wherein n represents 1; R_1 and R_4, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, or a lower alkenyl group; R_2 and R_3, which may be the same or different, each represents a hydrogen atom, a hydroxyl group, a lower alkanoyloxy group, a lower alkyl group or a lower alkenyl group; said R_2 and R_3 may further form together a double bond; R_5 and R_6, which may be the same or different, each represents a hydrogen atom, a halogen atom, a hydroxyl group, a nitro group, an amino group, a lower alkoxy group, a mono or di lower alkylamino group, or a lower alkyl group; said R_5 and R_6, may further form together a lower alkylenedioxy group; and R_7 represents a hydrogen atom, a halogen atom, a lower alkanoyl group, a phenyl group, a phenyl lower alkyl group, a lower alkyl group, a hydroxy lower alkyl group, a di-lower alkylamino lower alkyl group, a pyrrolidino lower alkyl group, a piperidino lower alkyl group, a morpholine lower alkyl group, or a 4-lower alkylpiperazino lower alkyl group; and the pharmaceutically acceptable nontoxic salts thereof.

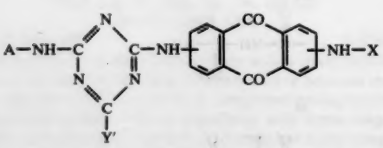
4,329,456

PROCESS FOR THE PREPARATION OF VAT DYES

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed May 15, 1980, Ser. No. 149,954
Claims priority, application Switzerland, May 17, 1979, 4595/79
Int. Cl.³ C07D *413/10, 251/52, 251/70, 403/10*
U.S. Cl. 544—113 7 Claims

1. In a process for the preparation of a vat dye of the formula



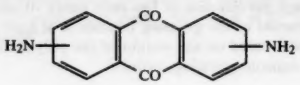
(1)

in which A is a vattable radical, X is an acyl radical of an aromatic carboxylic acid or an alkanoyl radical and Y′ is an amino group or an aryloxy group which comprises reacting a compound of the formula

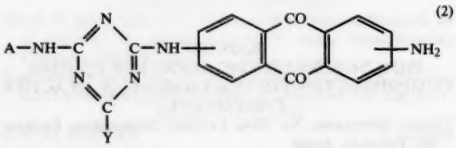
A-NH_2

with a 2,4,6-trihalogeno-s-triazine of the formula

in which Y is a halogen atom, in a molar ratio of 1:1, subjecting the resulting primary condensation product to a condensation reaction with a diaminoanthraquinone or a mixture of diaminoanthraquinones of the formula



in a molar ratio of 1:1 to form a compound of the formula



(2)

acylating the compound of formula (2) by reacting with an acylating agent which contains the radical X, and subjecting the resultant product to a condensation reaction with an amine or an aromatic hydroxy compound to form the vat dye of formula (1), the improvement wherein the reaction of the compound of formula (2) with the acylating agent is carried out immediately following the preparation of the compound of formula (2) without intermediate isolation of the compound of formula (2).

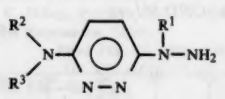
4,329,457

PROCESS FOR THE PREPARATION OF 6-(SUBSTITUTED AMINO)-3-PYRIDAZINYLHYDRAZINES AND THEIR SALTS

Geza Szilagyi, Budapest; Peter Matyus, Esztorgom; Endre Kasztreiner, Budapest; Tibor Balogh, Budapest, and Lajos Ila, Budapest, all of Hungary, assignors to Richter Gedeon Vegyészeti Gyár Rt., Budapest, Hungary

Filed May 6, 1980, Ser. No. 147,224
Claims priority, application Hungary, May 7, 1979, G0-1445
Int. Cl.³ C07D *413/02, 237/20*
U.S. Cl. 544—114 2 Claims

1. A process for the preparation of a compound having the formula I



I

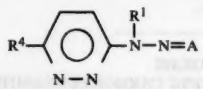
wherein

R^1 is hydrogen or an alkyl group of 1 to 4 carbon atoms;

R^2 and R^3 are the same or different and are each alkyl groups of 1 to 6 carbon atoms, alkenyl groups of 2 to 6 carbon atoms, hydroxyalkyl groups of 2 to 4 carbon atoms, cycloalkyl groups of 3 to 8 carbon atoms, phenyl or benzyl, or phenyl, benzyl or phenylethyl groups containing one or two halogen atoms, nitro, methoxy or hydroxyl groups, and wherein one of R^2 and R^3 can be hydrogen, or R^2 and

R^3 together with the neighboring nitrogen atom can form a morpholino, pyrrolidino, piperidino, heptamethyleneimino or N-methylpiperazino group,

or a therapeutically acceptable acid-addition salt of the compound, which comprises reacting a compound having the formula II

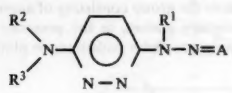


II

wherein R^4 is chlorine or bromine or methylthio, and A is 1,7,7-trimethyl-2-bicyclo(2,2,1)heptylidene or a benzylidene substituted with an R^5 group, wherein R^5 is hydrogen, chlorine or bromine, or a methoxy, nitro or methylsulphonyl group—with an amine having the formula III

$$R^2R^3NH \qquad III$$

at a temperature of 100° to 200° C. and subjecting the compound thus obtained having the formula IV



IV

to acidic hydrolysis at 20° to 60° C. in a two-phase system comprising a hydrocarbon phase and an aqueous phase containing a mineral acid.

4,329,458

PROCESS FOR THE PREPARATION OF 2,4,6-TRIFLUORO-1,3,5-TRIAZINE

Erich Klauke, Odenthal; Ernst Kysela, Berg.-Gladbach; Arnd Stüwe, Brunsbuettel, and Alfons Dorlars, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,328

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3008923

Int. Cl.³ C07D *251/28*

U.S. Cl. 544—217 **8 Claims**

1. Process for the preparation of 2,4,6-trifluoro-1,3,5-triazine (TFT) from 2,4,6-trichloro-1,3,5-triazine (TCT) or from mixed chlorinated/fluorinated 1,3,5-triazines by fluorination with NaF in a dipolar, aprotic solvent, characterised in that TCT is metered into a suspension warmed to 120° C. to 220° C., of NaF in a dipolar, aprotic solvent, which optionally contains a further solvent.

4,329,459

TETRAHYDROBENZOPYRAN DERIVATIVES

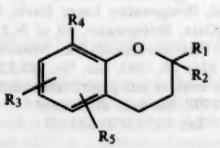
John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 5, 1980, Ser. No. 146,904

Int. Cl.³ C07D *311/04*

U.S. Cl. 544—264 **16 Claims**

1. A compound of the formula I



I

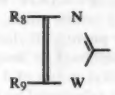
or a pharmaceutically acceptable salt thereof, wherein

(a) R_3 is hydrogen, halogen, trihalomethyl, alkyl of from one to 8 carbon atoms, or alkoxy of from one to 8 carbon atoms;

(b) R_5 is hydrogen, halogen, alkyl of from one to 8 carbon atoms;

(c) R_1 and R_2 are the same or different and are hydrogen, alkyl of from one to 3 carbon atoms, or taken together form a spiroalkyl compound of from 3 to 6 carbon atoms;

(d) R_4 is selected from the group consisting of heterocycles of formula II;



II

wherein W is NH, NR_{10}, CH_2, S, OR O;

(e) R_{10} is hydrogen, alkyl of from one to 8 carbon atoms, or aralkyl of from 6 to 12 carbon atoms; and

(f) R_8 and R_9 are hydrogen, alkyl of from one to 3 carbon atoms, phenyl or phenyl substituted by one or two of the following:
halogen,
trihalomethyl,
alkyl of from one to 3 carbon atoms,
alkoxy of from one to 3 carbon atoms,
amino, or
hydroxy,
of from 3 to 8 carbon atoms,
or when taken together with the carbon atoms to which they are attached form a cyclic or heterocyclic moiety selected from the following:
pyridyl,
pyrimidyl,
phenyl,
pyridazinyl,
pyrazolyl,
triazolyl, and
pyrrolyl,
with the proviso that R_8 and R_9 form a heterocyclic moiety only when W is not CH_2,

said cyclic heterocyclic moieties are optionally substituted by one or two of the following:
halogen,
trihalomethyl,
alkyl of from one to 3 carbon atoms,
alkoxy of from one to 3 carbon atoms,
amino, or hydroxy;
and the tautomeric forms thereof.

4,329,460

URACIL DERIVATIVES AND PRODUCTION THEREOF

Osamu Miyashita, Takatsuki; Koichi Matsumura, Ibaraki; Hiroshi Shimadzu, Settsu, and Naoto Hashimoto, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

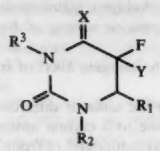
Continuation of Ser. No. 780,683, Mar. 23, 1977, abandoned. This application Jun. 13, 1979, Ser. No. 48,169

Claims priority, application Japan, Mar. 31, 1976, 51-36653; Oct. 27, 1976, 51-129932; Dec. 6, 1976, 51-146795

Int. Cl.³ A61K *31/515;* **C07D** *239/22, 401/04, 401/06*

U.S. Cl. 544—301 **62 Claims**

1. A compound having the formula:



wherein

X is O;

Y is a group of the formula —COOY' wherein Y' is cycloalkyl or alkyl of 1 to 18 carbon atoms, allyl, phenalkyl of 7 to 8 carbon atoms or phenyl, alkylphenyl, alkoxyphenyl, halophenyl, haloalkylphenyl or aminophenyl of 6 to 8 carbon atoms, said alkyl group of 1 to 18 carbon atoms being unsubstituted or substituted by halogen or ethoxy or CN; R_1 is a member of the group consisting of (1) hydroxy, (2) etherified hydroxyl selected from the group consisting of alkoxy and cycloalkoxy groups of 1 to 18 carbon atoms, hydroxyethoxy, chloroethoxy, methoxyethoxy, ethoxyethoxy, trifluoroethoxy, allyloxy, cyclohexenyloxy, propargyloxy, 3-butynyloxy, 2-butynyloxy, benzyloxy, p-chlorobenzyloxy, p-fluorobenzyloxy, phenethyloxy and phenoxy, alkylphenoxy, haloalkylphenoxy of 6 to 8 carbon atoms, (3) etherified mercapto corresponding to the etherified hydroxyl as defined above, (4) β-naphthylmercapto and (5) esterified hydroxyl selected from the group consisting of alkanoyloxy or haloalkanoyloxy having 1 to 4 carbon atoms, benzoyloxy, p-methoxybenzoyloxy, p-chlorobenzoyloxy, p-methoxybenzoyloxy, phenylacetyloxy, p-toluenesulfonyloxy and methanesulfonyloxy; and R_2 and R_3, respectively, are H, lower alkyl or

18. 3,5-difluoro-6-hydroxy-1,2,3,4,5,6-hexahydro-2,4-dioxopyrimidine-5-carbonitrile.

4,329,461

FLUORESCENT THYROID HORMONE CONJUGATES AND THEIR USES

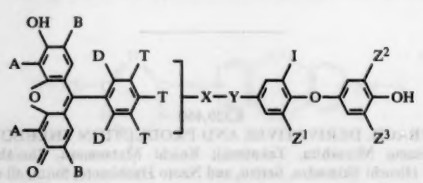
Pyare L. Khanna, San Jose, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Jan. 11, 1980, Ser. No. 111,158

Int. Cl.³ C07D *405/12;* A61K *31/495*

U.S. Cl. 544—375 **9 Claims**

1. A fluorescent compound of the formula



wherein:

A is hydrogen, alkyl, halo, or substituted alkyl;

B is hydrogen, alkyl, halo, substituted alkyl, oxy or thio;

wherein when A and B are alkyl they are from one to six carbon atoms and when substituted alkyl, substituted intends halo, hydroxy, mercapto, oxy-ether or thio-ether of from 1 to 2 carbon atoms, and carboxy;

D is hydrogen, halo, or non-oxo-carbonyl;

one of the Ts is a bond to X, when other than a bond to X, T is hydrogen, non-oxo-carbonyl, or halo;

at least two of Z^{1-3} are halogen of atomic number 35 to 53, wherein Z^1 is hydrogen or iodine and Z^2 and Z^3 are hydrogen, bromine or iodine;

Y is $(—CO\{(CH\{NH\}_p\{H\})_q(CH_2)_n\}_m—)$, where n is 0 to 2 and m, p and q are 0 to 1;

X is N-carbonylpiperazinyl.

4,329,462

PROCESS FOR PRODUCING CARBOXYLIC AMIDES

Nobuhiro Tamura, Chigasaki; Yohei Fukuoka, Kurashiki; Joji Nishikido, Fuji; Setsuo Yamamatsu, Fuji, and Yoshio Suzuki, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP79/00201, § 371 Date Apr. 3, 1980, § 102(e) Date Mar. 28, 1980

PCT Filed Aug. 1, 1979, Ser. No. 195,740

Claims priority, application Japan, Aug. 3, 1978, 53-94135

Int. Cl.³ C07D *295/10*

U.S. Cl. 544—387 **15 Claims**

1. A process for producing a carboxylic amide, characterized in that a primary alcohol is allowed to react with at least one compound selected from the group consisting of ammonia, primary amines, and secondary amines, in the presence of a molecular oxygen-containing gas and a palladium or platinum catalyst.

4,329,463

SUBSTITUTED 1H-1,2,4-TRIAZOLES

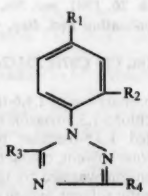
Stanley A. Lang, Jr., Stony Point; Yang-i Lin, Nanuet, and David N. Ridge, Grandview, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 69,671, Aug. 27, 1979, Pat. No. 4,259,504. This application Dec. 2, 1980, Ser. No. 212,070

Int. Cl.³ A61K *31/44, 31/495;* C07D *401/04, 403/04*

U.S. Cl. 544—405 **5 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 and R_2 are each individually selected from the group consisting of hydrogen, fluoro, chloro, bromo, nitro, amino and dimethylaminomethyleneamino; R_3 is selected from the group consisting of 2-pyridyl, 3-pyridyl, 4-pyridyl and 2-pyrazinyl; and R_4 is hydrogen or methyl; and the pharmaceutically acceptable acid addition salts thereof.

4,329,464

SPIRO[DIHYDROBENZOFURAN-PIPERIDINES AND -PYRROLIDINES]

Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Joseph T. Klein, Bridgewater, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed May 20, 1981, Ser. No. 265,520

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ C07D *521/00*

U.S. Cl. 546—17 **3 Claims**

3. The compound 5-chloro-2,3-dihydro-1'-methyl-3-(1-pyr-

ryl)spiro(benzofuran-2,4'-piperidine) or a pharmaceutically acceptable addition salt thereof.

4,329,465

DIBENZO[a,d]CYCLOOCTEN-6,12-IMINES

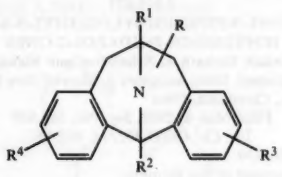
Paul S. Anderson, Lansdale; Marcia E. Christy, Perkasie; Ben E. Evans, Lansdale, and David C. Remy, North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 917,044, Jun. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 834,343, Sep. 19, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 80,896

Int. Cl.[3] C07D *221/18;* A61K *31/47*

U.S. Cl. 546—072 2 Claims

1. The compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen or C_{1-3}alkyl; R^2 is C_{1-3}alkyl, and R^1, R^3 and R^4 are all hydrogen.

4,329,466

CERTAIN NOR-TROPAN-8-AMINE-3-ARYL OR HETEROARYL DERIVATIVES

Philippe L. Dostert, Paris; Thierry F. Imbert, Noisy le Roi, and Bernard P. Bucher, Marnes la Coquette, all of France, assignors to Delalande S.A., Courbevoie, France

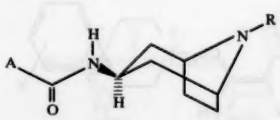
Division of Ser. No. 110,067, Jan. 7, 1980. This application Apr. 16, 1981, Ser. No. 254,684

Claims priority, application France, Jan. 16, 1979, 79 00971; Dec. 26, 1979, 79 31656

Int. Cl.[3] C07D *451/02*

U.S. Cl. 546—125 6 Claims

1. A compound having the formula



(I)

in which R and ACO are selected from the following combinations:

1. R is 2-methyl thiophene or 3-methyl thiopene, and ACO is 2-methoxy-4-amino-5-bromobenzoyl, and
2. R is 2-methyl thiophene, 3-methyl thiophene or 2-methyl furan, and ACO is 2-methoxy-4-amino-5-chlorobenzoyl,

and pharmacologically acceptable acid addition salts thereof.

4,329,467

PHENYL-QUINOLIZIDINES

Rene Imhof, Wittnau, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

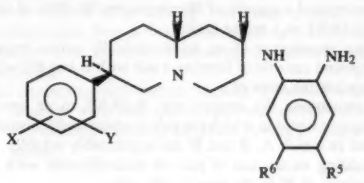
Division of Ser. No. 148,646, May 12, 1980, Pat. No. 4,272,627, which is a division of Ser. No. 85,906, Oct. 15, 1979, Pat. No. 4,236,010. This application Dec. 18, 1980, Ser. No. 217,887

Claims priority, application Switzerland, Oct. 13, 1978, 10654/78; Aug. 3, 1979, 7156/79

Int. Cl.[3] C07D *455/02*

U.S. Cl. 546—138 1 Claim

1. A compound of the formula



X

wherein X is hydrogen, fluorine, chlorine, lower alkoxy, lower alkyl or trifluoromethyl; Y is hydrogen, fluorine, chlorine, lower alkoxy or lower alkyl; R^5 and R^6, independently, are hydrogen, methyl, fluorine, chlorine, methoxy or trifluoromethyl, or taken together are $—(CH_2)_4—$, its racemate or an enantiomer thereof.

4,329,468

3,4-DIHYDROCARBOSTYRIL DERIVATIVES

Kazuyuki Nakagawa; Nanami Murakami, both of Tokushima; Shiro Yoshizaki, Komatsujima; Hideo Mori, and Michiaki Tominaga, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

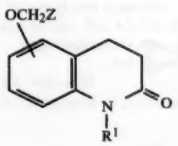
Division of Ser. No. 886,373, Mar. 14, 1978, Pat. No. 4,256,890, which is a continuation of Ser. No. 601,569, Aug. 1, 1975, abandoned, which is a continuation of Ser. No. 325,981, Jan. 23, 1973, abandoned. This application Jun. 24, 1980, Ser. No. 162,353

Claims priority, application Japan, Sep. 14, 1972, 47-92557; Sep. 14, 1972, 47-92558; Sep. 14, 1972, 47-92560; Dec. 2, 1972, 47-120953; Dec. 14, 1972, 47-125858; Dec. 21, 1972, 47-128972

Int. Cl.[3] C07D *215/22*

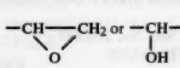
U.S. Cl. 546—158 2 Claims

1. Novel 3,4-dihydrocarbostyril derivatives represented by the formula



(II)

wherein R^1 is selected from the group consisting of a hydrogen atom, a straight or branched alkyl group having 1 to 4 carbon atoms, an unsubstituted phenylalkyl group having 1 to 4 carbon atoms in the alkyl moiety and an alkenyl group having 2 to 4 carbon atoms, and Z represents a group of the formula



wherein Y represents a halogen atom.

4,329,469
DISPLACEMENT PURIFICATION OF SALTS

Torleif Utne, Warren, and Ronald B. Jobson, East Brunswick, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 24, 1980, Ser. No. 209,814
Int. Cl.[3] C07D *211/70*
U.S. Cl. 546—203 3 Claims

1. A process for the purification of a diastereomeric salt of formula:

A.(B,B')

wherein

B is a basic optically pure organic compound;

B' is an optical antipode of B comprising 10–30% of combined (BB') on a molar basis;

A is one enantiomer of an acidic optically active organic compound capable of forming a salt with B and B'; which comprises the steps of:

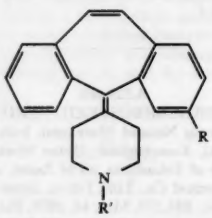
(1) suspending the impure salt, A.(B,B'), in an aprotic organic liquid in which the salt is substantially insoluble and in which A, B and B' are appreciably soluble;

(2) adding an amount of pure B equimolecular with the amount of B' in the impure salt; and

(3) agitating the mixture;

whereby B' in the impure salt is replaced by B to form the more pure salt A.B.

2. The process of claim 1 wherein B is:



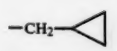
(−)-isomer

wherein R is

(1) —CN,
(2) $-SCF_3$
(3) $-SO_2CF_3$
(4) $-OCH_3$ or
(5) —halo; and

R' is

(1) $-CH_3$ or
(2)



and

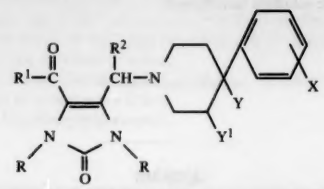
A is di-p-toluoyl-d-tartaric acid.

4,329,470
5-(4-PHENYL 1-PIPERIDINYL)METHYL-2,3-DIHYDRO-2-OXO-1H-IMIDAZOLE-4-CARBOXYLIC ACID DERIVATIVES

J. Martin Grisar; Richard A. Schnettler, and Richard C. Dage, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed May 4, 1981, Ser. No. 260,447
Int. Cl.[3] C07D *401/06*
U.S. Cl. 546—210 5 Claims

1. A compound of the formula:



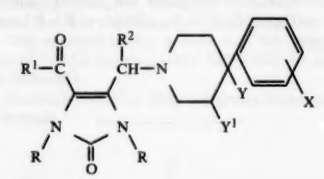
wherein R is hydrogen, lower alkyl of 1–4 C, lower alkanoyl of 2–4 C, or benzoyl; R^1 is hydroxy, lower alkoxy of 1–4 C, amino, (lower alkyl)amino, (lower alkyl)$_2$amino or $—NHR_5$ wherein R_5 is phenyl, methylphenyl, dimethylphenyl or methoxyphenyl; R^2 is hydrogen or lower alkyl of 1–4 C; X is hydrogen, halogen, methyl, methoxy or trifluoromethyl; Y is hydrogen, hydroxy, cyano, acetyl or (C_{1-4} lower alkoxy)carbonyl; Y^1 is hydrogen or Y and Y^1 together form a double bond; and the pharmaceutically acceptable acid addition salts.

4,329,471
4-(4-PHENYL-1-PIPERIDINYL)METHYL-5-ACYL-1,3-DIHYDRO-2H-IMIDAZOL-2-ONES

J. Martin Grisar; Richard A. Schnettler, and Richard C. Dage, all of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

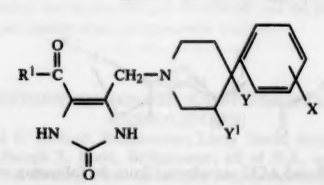
Filed May 4, 1981, Ser. No. 260,449
Int. Cl.[3] C07D *401/14, 401/06*
U.S. Cl. 546—210 5 Claims

1. A compound of the formula:



wherein R is hydrogen, lower alkyl of 1–4 C, lower alkanoyl of 2–4 C, or benzoyl; R^1 is lower alkyl of 1–4 C, phenyl, halophenyl, methylphenyl, methoxyphenyl, methylsulfonylphenyl, dimethylaminophenyl, dimethoxyphenyl, 3,4-methylenedioxyphenol, 2-furyl, 2-thienyl or pyridyl; R^2 is hydrogen or lower alkyl of 1–4 C; X is hydrogen halogen, methyl, methoxy or trifluoromethyl; Y is hydrogen, hydroxy, cyano, acetyl or (C_{1-4} lower alkoxy)carbonyl; Y^1 is hydrogen or Y and Y^1 together form a double bond; and the pharmaceutically acceptable acid addition salts.

2. A compound according to claim 1 which has the formula:



wherein R^1 is lower alkyl of 1–4 C, phenyl, halophenyl, methylphenyl, methoxyphenyl, methylsulfonylphenyl, dimethylaminophenyl, dimethoxyphenyl, 3,4-methylenedioxyphenyl, 2-furyl, 2-thienyl or pyridyl; X is hydrogen, halogen, methyl, methoxy and trifluoromethyl; Y is hydrogen, hydroxy, cyano,

acetyl or (C_{1-4} lower alkoxy)carbonyl; Y^1 is hydrogen or Y and Y^1 together form a double bond.

4,329,472

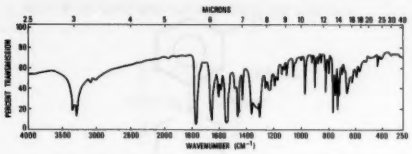
ANTIBIOTIC A-33853 AND THE TETRAACETYL DERIVATIVE THEREOF

Marvin M. Hoehn, and Karl H. Michel, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

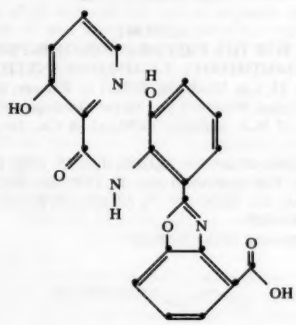
Division of Ser. No. 123,330, Feb. 21, 1980, Pat. No. 4,293,649. This application Apr. 13, 1981, Ser. No. 253,346

Int. Cl.³ C07D *413/12*

U.S. Cl. 546—270 **2 Claims**



1. Antibiotic A-33853 of the structure



4,329,473

OXOALKANOIC ACID DERIVATIVES AS INHIBITORS OF ANGIOTENSIN CONVERTING ENZYME

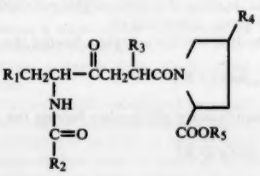
Ronald G. Almquist, 2463 Burnham Way, Palo Alto, Calif. 94303, and Joseph I. De Graw, 880 Hanover, Sunnyvale, Calif. 94087

Continuation-in-part of Ser. No. 44,685, Jun. 1, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,885

Int. Cl.³ C07D *207/12, 207/16, 401/12, 405/12*

U.S. Cl. 546—281 **22 Claims**

1. Compounds having the structure



wherein

R_1 represents aryl;

R_2 represents aryl, alkyl or alkoxy;

R_3 represents hydrogen or lower alkyl;

R_4 represents hydrogen or hydroxyl; and

R_5 represents hydrogen or lower alkyl; and pharmaceutically acceptable salts of said compounds.

4,329,474

SELECTIVE SOLVENT EXTRACTION OF SYMMETRICAL TETRACHLOROPYRIDINE

Thomas E. Dergazarian, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 20, 1981, Ser. No. 255,592

Int. Cl.³ C07D *213/61*

U.S. Cl. 546—345 **8 Claims**

1. A method of selectively extracting symmetrical tetrachloropyridine from a mixture comprising symmetrical tetrachloropyridine, iodide ions and an aprotic solvent, said method comprising:

(a) contacting said mixture with an extractant which is immiscible with said iodide ions and aprotic solvent, said extractant comprising an alkane having at least six carbon atoms.

4,329,475

SELECTED POLY(OXYALKYLATED) 1,3,4-THIADIAZOLES AND THEIR USE AS CORROSION INHIBITORS

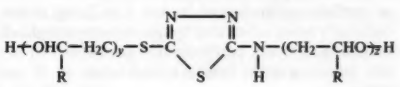
Eugene F. Rothgery, North Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 10, 1980, Ser. No. 205,556

Int. Cl.³ C07D *285/12;* C23F *11/00, 11/04;* C23G *1/06*

U.S. Cl. 548—141 **5 Claims**

1. A poly(oxyalkylated) 1,3,4-thiadiazole having the formula:



wherein each R is individually selected from either H or CH_3; and the sum of y and z is from 2 to about 30.

4,329,476

ALKYLTHIODIAZATRITHIAPENTALENES

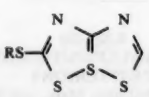
Thomas S. Woods, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 42,944, May 29, 1979, Pat. No. 4,234,592. This application Apr. 21, 1980, Ser. No. 142,172

Int. Cl.³ C07D *277/00*

U.S. Cl. 548—153 **10 Claims**

1. A compound of the formula



II

wherein

R is alkenyl of C_3–C_6, optionally substituted with 1–2 chlorines; cycloalkyl of C_3–C_8; cycloalkylalkyl of C_6–C_8; and $CH_2)_nR'$

wherein

n is 2 and

R′ is phenyl, optionally substituted with 1–2 chlorines.

4,329,477

PROCESS FOR THE PRODUCTION OF 4- OR 5-METHYL-2-MERCAPTOBENZIMIDAZOLE

Rüdiger Schubart, Bergisch-Gladbach, and Günter P. Langner, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,864

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008159

Int. Cl.[3] C07D *487/00*

U.S. Cl. 548—305 6 Claims

1. A process for the production of 4- or 5-methyl-2-mercaptobenzimidazole, wherein 1 part of 4- or 5-methyl benzimidazolone is reacted with 3 to 10 parts by weight of carbon disulphide in the presence of 1% to 12% by weight of basic catalyst, based on benzimidazole, at a temperature in the range from 200° C. to 300° C.

4,329,478

CYCLIC PERFLUOROALIPHATICDISULFONIC ACID ANHYDRIDES

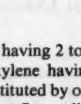
Fred E. Behr, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 30, 1981, Ser. No. 229,871

Int. Cl.[3] C07D *327/00*

U.S. Cl. 549—11 6 Claims

1. Cyclic anhydrides of perfluoroaliphaticdisulfonic acids, having the formula:



wherein

R_f is perfluoroalkylene having 2 to 5 catenary carbon atoms or perfluorocycloalkylene having 4 to 7 ring atoms, R_f optionally being substituted by one or more straight chain, branched, or cyclic perfluoroalkyl groups of 1 to 12 carbon atoms, with R_f having a total of up to 14 carbon atoms.

4,329,479

PROCESS FOR PRODUCING 1,3-DITHIOL-2-YLIDENE MALONIC ACID DIALKYL ESTERS

Kunihiro Yabutani, Neyagawa; Hisanori Matsui, Nishinomiya; Hiroshi Tanaka, Neyagawa, and Hitoshi Kurono, Toyonaka, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1981, Ser. No. 252,003

Int. Cl.[3] C07D *339/06*

U.S. Cl. 549—39 7 Claims

1. A process for producing 1,3-dithol-2-ylidene malonic acid dialkyl esters which is characterized by reacting a dialkyloxycarbonylketene dimercaptide with a 1,1-dihalogenoethylene.

4,329,480

CYCLIC META-SULFONIUM-PHENOXIDE ZWITTERIONS

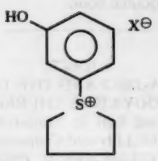
George A. Doorakian, Waltham, Mass., and Donald L. Schmidt, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 892,049, Mar. 31, 1978, abandoned, which is a continuation of Ser. No. 582,554, May 29, 1975, abandoned. This application Apr. 13, 1981, Ser. No. 253,477

Int. Cl.[3] C07D *333/16;* C08G *59/00, 75/00*

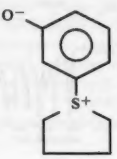
U.S. Cl. 549—78 2 Claims

1. A compound of the formula:



wherein $X^{\ominus}$ is one equivalent of a compatible anion and the aromatic ring may bear lower alkyl substituents.

2. A compound of the formula:



wherein the aromatic ring may bear lower alkyl substituents.

4,329,481

PROCESS FOR THE PREPARATION OF N-PROTECTED N-FORMIMIDOYL 2-AMINOETHANETHIOL

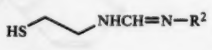
Thomas M. H. Liu, Westfield; Robert A. Reamer, Bloomfield; Ichiro Shinkai, Westfield, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 162,990, Jun. 25, 1980, Pat. No. 4,292,436. This application Apr. 17, 1981, Ser. No. 255,085

Int. Cl.[3] C07C *149/70, 125/06;* C07F *7/10*

U.S. Cl. 556—410 2 Claims

1. A compound of the formula:



wherein R^2 is hydrogen or a protecting group.

4,329,482

PREPARATION OF MIXED CYCLOTETRASILOXANES AND ALIPHATIC CHLORIDES AND/OR ACYL CHLORIDES

Maher Y. A. I. Elsheikh, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 10, 1981, Ser. No. 282,288

Int. Cl.[3] C07F *7/08*

U.S. Cl. 556—436 18 Claims

1. A method for preparing a cyclotetrasiloxane and an aliphatic chloride and/or an acyl chloride, said method comprising heating a mixture consisting essentially of

(I) one molar portion of a silane-acyloxy component selected from the group consisting of

(A) a silylhydrocarbonoxy acylate having the formula

$$R^1{}_aCl_{(3-a)}SiQO_2CR^2,$$

(B) a hydrocarbonoxy silylacylate having the formula

$$R^1{}_aCl_{(3-a)}SiQCO_2R^2,$$

and

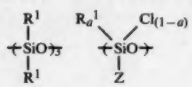
(C) a mixture of equimolar amounts of

(i) a silane having the formula $R^1{}_bSiCl_{(4-b)}$ and

(ii) an acyloxy compound selected from the group consisting of hydrocarbon carboxylic esters and hydrocarbon carboxylic anhydrides, wherein, at each occurence,

a denotes a number having a value of 0 or 1;
b denotes a number having a value of 0, 1 or 2;
R^1 denotes a monovalent substituted or unsubstituted hydrocarbon radical;
R^2 denotes a monovalent unsubstituted hydrocarbon radical;
Q denotes a divalent substituted or unsubstituted hydrocarbon radical; any hydrocarbon radical bonded to an oxygen atom of an acyloxy radical being bonded at an aliphatic carbon atom of said any hydrocarbon radical and

(II) at least one molar portion of a cyclotrisiloxane having the formula $(R^1{}_2SiO—)_3$ wherein each R^1 denotes, independently, a monovalent substituted or unsubstituted hydrocarbon radical; said heating being sufficient to produce a cyclotetrasiloxane having the formula



wherein R^1 and a are as denoted above and Z denotes a radical selected from the group consisting of R^1, Cl, QCOCl and QCl and at least one reaction product selected from the group consisting of an acyl chloride and an aliphatic chloride; the substituents of said substituted hydrocarbon radicals being non-reactive during said heating.

4,329,483

PREPARATION OF CYCLOTETRASILOXANES ALIPHATIC CHLORIDES AND ACYL CHLORIDES

John L. Speier, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 10, 1981, Ser. No. 282,289
Int. Cl.³ C07F 7/08
U.S. Cl. 556—436 **13 Claims**

1. A method for preparing a cyclotetrasiloxane and an aliphatic chloride and/or an acyl chloride, said method comprising heating a reaction mass selected from the group consisting of

(A) a silylhydrocarbonoxy acylate having the formula

$$R^1{}_aCl_{(3-a)}SiQO_2CR^2,$$

(B) a hydrocarbonoxy silylacylate having the formula

$$R^1{}_aCl_{(3-a)}SiQCO_2R^2,$$

and

(C) a mixture of equimolar amounts of
(i) a silane having the formula $R^1{}_bSiCl_{(4-b)}$ and
(ii) an acyloxy compound selected from the group consisting of hydrocarbon carboxylic esters and hydrocarbon carboxylic anhydrides, wherein, at each occurrence,
a denotes a number having a value of 0 or 1;
b denotes a number having a value of 0, 1 or 2;
R^1 denotes a monovalent substituted or unsubstituted hydrocarbon radical;
R^2 denotes a monovalent unsubstituted hydrocarbon radical;
Q denotes a divalent substituted or unsubstituted hydrocarbon radical; any hydrocarbon radical bonded to an oxygen atom of an acyloxy radical being bonded at an aliphatic carbon atom of said any hydrocarbon radical; said heating being sufficient to produce a cyclotetrasiloxane wherein each silicon atom bears two-fewer chlorine atoms than were present on each silicon atom in the reaction mass and at least one reaction product selected from the group consisting of an acyl chloride and an aliphatic chloride; the substituents of said substituted hydrocarbon radicals being non-reactive during said heating.

4,329,484

CONTINUOUS PROCESS FOR PREPARING ACYLOXYSILANES

Louis P. Petersen, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,542
Int. Cl.³ C07F 7/04, 7/08
U.S. Cl. 556—442 **18 Claims**

1. In a process for producing acyloxysilane by reacting a chlorosilane with an aliphatic carboxylic acid in a column at an elevated temperature wherein the aliphatic carboxylic acid in the vapor phase passes upward from the bottom of the column countercurrent to the flow of the chlorosilane passing downward in the column, the improvement comprising introducing the carboxylic acid into the column at such a rate that the carboxylic acid exceeds 1.3 mole per gram atom of silicon-bonded chlorine in the column and removing low boiling reaction by-products from the top of the column while collecting the acyloxysilane product at the bottom of the column.

4,329,485

PROCESS FOR PREPARING ALKOXYSILANE CLUSTER COMPOUNDS BY REACTING A TRIALKOXYSILANOL WITH A TRIAMIDOSILANE

Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jun. 29, 1981, Ser. No. 278,149
Int. Cl.³ C07F 7/18, 7/08, 7/04
U.S. Cl. 556—458 **9 Claims**

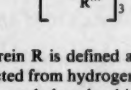
1. A process for preparing an alkoxysilane cluster compound of the formula:

$$RSi[OSi(OR')_3]_3$$

wherein R is hydrogen, alkyl, alkenyl, aryl, aralkyl; each R′ is independently selected from the same group as R subject to a first proviso that at least a majority of said R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms;
comprising reacting a trialkoxysilanol of the formula:

$$HOSi[OR']_3$$

wherein R′ is defined above, with a triamidosilane of the formula:



wherein R is defined above, and R″ and R‴ are individually selected from hydrogen, lower alkyl groups having 1–4 carbon atoms and phenyl, subject to a second proviso that both R″ and R‴ may not be hydrogen; employing at least 2.5 moles of said trialkoxysilanol per one mole of said triamidosilane;
and said reaction being carried out at about 60° C. to about 200° C.

4,329,486

PROCESS FOR PREPARING ALKOXYSILANE CLUSTER COMPOUNDS BY REACTING A TRIALKOXYSILANOL WITH AN AMIDATED ALKOXYSILANE CLUSTER COMPOUND

Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jun. 29, 1981, Ser. No. 278,225
Int. Cl.[3] C07F 7/18, 7/08, 7/04
U.S. Cl. 556—458 9 Claims

1. A process for preparing an alkoxysilane cluster compound of the formula:

$$RSi[OSi(OR')_3]_3$$

wherein R is hydrogen, alkyl, alkenyl, aryl, aralkyl; each R' is independently selected from the same group as R subject to a proviso that at least a majority of said R' radicals are sterically hindered alkyl groups having at least 3 carbon atoms;

comprising reacting a trialkoxysilanol of the formula:

$$HOSi[OR']_3$$

wherein R' is defined above, with an amidated alkoxysilane cluster compound of the formula:

$$RSi[OSi(OR')_3]_2NR''R'''$$

wherein R and R' are defined above, and R'' and R''' are individually selected from hydrogen, lower alkyl groups having 1–4 carbon atoms and phenyl; employing at least 0.8 moles of said trialkoxysilanol per one mole of said amidated alkoxysilane cluster compound;

and said reaction being carried out at about 60° C. to about 200° C.

4,329,487

METHOD FOR THE ASYMMETRIC HYDROGENATION OF α-KETOESTERS

Yoshio Orito, Musashino; Sumi Imai, Funabashi, and Shuichi Niwa, Yatabe, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 25, 1980, Ser. No. 124,149
Claims priority, application Japan, Jun. 5, 1979, 54/70234
Int. Cl.[3] C07C 69/76, 69/66; B01J 31/02
U.S. Cl. 560—60 5 Claims

1. A method for the asymmetric hydrogenation of α-ketoesters containing an α-ketoester grouping of the formulae —CO—COO—, which comprises subjecting an α-ketoester of an α-keto acid selected from pyruvic acid and benzoylformic acid to asymmetric hydrogenation in the presence of an platinum-alumina catalyst modified with a solution of a cinchona-alkaloid.

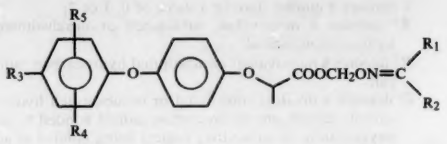
4,329,488

PROPIONIC ACID ESTERS AND HERBICIDAL USE THEREOF

Georg Frater, Greifensee, and Jean Wenger, Uster, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 5, 1980, Ser. No. 213,282
Int. Cl.[3] C07C 69/76
U.S. Cl. 560—62 23 Claims

1. A compound of the formula



wherein R_1 is hydrogen, alkyl of from 1 to 6 carbon atoms or phenyl, R_2 is alkyl of from 1 to 6 carbon atoms, alkenyl of from 2 to 6 carbon atoms, alkynyl of from 2 to 6 carbon atoms or phenyl, or R_1 and R_2 together with the carbon atom to which they are attached form a cycloalkane ring with 4 to 10 carbon atoms which is unsubstituted or is mono-, di- or tri-substituted with alkyl of from 1 to 3 carbon atoms, R_3 is halogen, trifluoromethyl or nitro and R_4 and R_5 each is hydrogen or halogen.

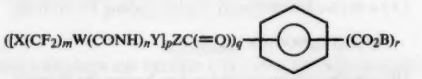
4,329,489

METHOD OF PREPARATION OF FLUOROCARBON COMPOUNDS

Peter R. Saunders, Richmond, and Raymond J. Biron, Colonial Heights, both of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed May 19, 1980, Ser. No. 151,499
Int. Cl.[3] C07C 67/08
U.S. Cl. 560—79 17 Claims

1. In the preparation, by the reaction of a perfluoroalkylethanol and pyromellitic dianhydride and subsequent conversion of pendent carboxyl groups to the alkyl ester-$(CO_2B)_n$, of a fluorocarbon compound having the formula



wherein the attachment of the fluorinated radicals and the radicals CO_2B to the nucleus is in asymmetrical positions with respect to rotation about the axis through the center of the nucleus wherein "X" is fluorine, or perfluoroalkoxy of 1 to 6 carbon atoms, and m has arithmetic mean between 2 and 20; n is zero or unity; "W" and "Y" are alkylene, cycloalkylene or alkyleneoxy radicals of combined chain length from 2 to 20 atoms; $(CF_2)_m$ and "Y" have each at least 2 carbon atoms in the main chain; "Z" is oxygen and p is 1, or "Z" is nitrogen and p is 2; q is an integer of at least 2 but not greater than 5; "B" is CH_2RCHOH or is $CH_2RCHOCH_2RCHOH$ where "R" is hydrogen or methyl, or "B" is $CH_2CH(OH)CH_2Q$ where Q is halogen, hydroxy, or nitrile; or "B" is $CH_2CH(OH)CH_2OCH_2CH(OH)CH_2Q$; and r is an integer of at least 1 but not greater than q; and $X(CF_2)_m$, W and Y are straight chains, branched chains or cyclic; and wherein the substituent chains of the above general formulas are the same or different, the improvement comprising

removing most of the impurities from the fluorocarbon mass with heat and vacuum after the final washing step, then

adding an emulsifier to the fluorocarbon compound mass so that the mass can be handled as a liquid concentrate rather than a tacky solid.

4,329,490

WATER-DISPERSIBLE URETHANE POLYMERS, AQUEOUS POLYMER DISPERSIONS AND HALF-ESTERS USEFUL THEREIN

Roy C. Williams, East Amherst, and David R. Rogemoser, Tonawanda, both of N.Y., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 44,674, Jun. 1, 1979, Pat. No. 4,268,426, which is a continuation-in-part of Ser. No. 36,506, May 7, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 141,983
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—90 6 Claims

1. A carboxylic group-containing, half-ester of anhydride of polycarboxylic acid selected from the group consisting of aromatic carboxylic acids having at least three carboxylic acid groups and aliphatic dicarboxylic acids of 4 to 5 carbon atoms, and a diol in which the hydroxy groups are primary and secondary or tertiary, or are secondary and tertiary, and when primary and secondary, the secondary hydroxyl group is attached to at least one tertiary or quaternary carbon atom.

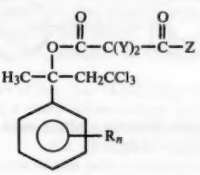
4,329,491

METHOD AND PRODUCT FOR TREATING SOIL TO SUPPRESS THE NITRIFICATION OF AMMONIUM NITROGEN THEREIN

R. Garth Pews, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 19, 1980, Ser. No. 150,769
Int. Cl.³ C07C *69/66*
U.S. Cl. 560—174 3 Claims

1. A compound having the formula



wherein each Y is independently hydrogen, chloro-, bromo-, fluoro- or methyl; Z is a straight or branched chain alkyl of 1–4 carbon atoms; R is C_1–C_4 alkyl, C_1–C_4 alkoxy or halo and n is an integer from 0 to 2.

4,329,492

PROCESS FOR PRODUCTION OF METHACRYLIC ACID ESTERS

Naoki Andoh, 1, Morigayama-cho; Itsuo Nishiwaki, 2114, Yamanoishilei-cho, and Masatoshi Arakawa, 1, Morigayama-cho, all of Yokkaichi City, Mie Prefecture, Japan

Continuation of Ser. No. 49,435, Jun. 18, 1979, which is a continuation-in-part of Ser. No. 951,191, Oct. 13, 1978, abandoned, which is a continuation of Ser. No. 817,182, Jul. 20, 1977, abandoned. This application Nov. 21, 1980, Ser. No. 209,032
Claims priority, application Japan, Jul. 27, 1977, 51/94473
Int. Cl.³ C07C *67/08*
U.S. Cl. 560—205 11 Claims

1. A continuous process for producing methacrylic acid esters from a hetergeneous reaction mixture containing methacrylic acid, a lower alcohol containing 1 to 3 carbon atoms, and sulfuric acid as a catalyst in a plurality of reaction zones in which the reaction product water is removed from the reaction mixture to improve the production of methacrylic acid ester, said process comprising:

a. introducing methacrylic acid and a reaction inert, hydrophobic organic solvent in which the ester being produced is soluble, the solvent being further characterized by inability to form an azeotrope with the said ester, into the first reaction zone of a reaction system comprising at least three reaction zones connected in series, the amount of the hydrophobic organic solvent being from about 0.1 to about 5 parts by weight per part by weight of the methacrylic acid;

b. introducing sulfuric acid at a concentration of from 50% to 80% by weight into the final reaction zone of the reaction system and the lower alcohol into any of the reaction zones;

c. reacting the methacrylic acid and the lower alcohol in a reaction mixture which is in the heterogeneous state in each reaction zone by maintaining the reaction mixture at a temperature of from about 0° C. to 100° C. for about 1 to 100 hours;

d. recovering and separating a hydrophobic organic solvent phase containing methacrylic acid ester and a sulfuric acid phase composed mainly of sulfuric acid and water from each reaction zone;

e. introducing each hydrophobic organic solvent phase except that recovered from the last reaction zone into the subsequent reaction zone and each sulfuric acid phase, except that recovered from the first reaction zone into the preceding reaction zone;

f. removing water from the sulfuric acid phase withdrawn from the first reaction zone to produce sulfuric acid at a concentration of from 50% to 80% by weight and returning it to the

final reaction zone as aforesaid in Step b.; and distilling the hydrophobic organic solvent phase withdrawn from the final reaction zone to separate methacrylate acid ester therefrom.

4,329,493

PROCESS FOR PRODUCING TEREPHTHALIC ACID

Hiroshi Hashizume, and Yoshiaki Izumisawa, both of Kitakyusyu, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Continuation of Ser. No. 860,479, Dec. 14, 1977. This application Jun. 18, 1980, Ser. No. 160,541
Claims priority, application Japan, Dec. 30, 1976, 51/158987
Int. Cl.³ C07C *51/16*
U.S. Cl. 562—414 12 Claims

1. A process for the continuous production of terephthalic acid, comprising:

oxidizing p-xylene with molecular oxygen in acetic acid as a solvent in the presence of a catalyst system containing cobalt, manganese, and bromine which results in a liquid medium containing said terephthalic acid and a vapor effluent containing methylacetate by-product;

passing said vapor through a condenser which recovers a portion of said methylacetate in said vapor as a condensate;

recovering at least a substantial amount of the remaining methylacetate in the off gas from the condenser by scrubbing said off-gas with acetic acid; and

recirculating said recovered methylacetate to said reaction.

4,329,494

RECYCLING TECHNIQUES IN THE PRODUCTION OF 6-HYDROXY-2-NAPHTHOIC ACID

Carroll S. Montgomery, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 22, 1981, Ser. No. 285,728
Int. Cl.³ C07C *51/15*
U.S. Cl. 562—425 5 Claims

1. In a process for preparing 6-hydroxy-2-naphthoic acid by (A) forming a mixture of 2-hydroxynaphthalene and a potassium base, (B) dehydrating the resultant mixture, (C) introducing carbon dioxide into the resultant dehydrated mixture while agitating under heat and pressure and (D) recovering 6-hydroxy-2-naphthoic acid, the improvement which comprises (E) heating said dehydrated mixture at about 270°–280° C. and about 68–74 psi until the ratio of 6-hydroxy-2-naphthoic acid to

the mixture of 6-hydrox-2-naphthoic cid and 3-hydroxy-2-naphthoic acid therein is at least about 0.4 and (F) introducing 3-hydroxy-2-naphthoic acid to either step (A) or step (B).

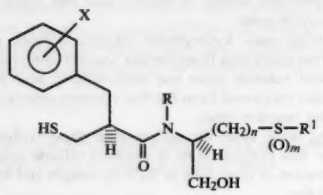
4,329,495

ENKEPHALINASE ENZYME INHIBITING COMPOUNDS

Jasjit S. Bindra, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

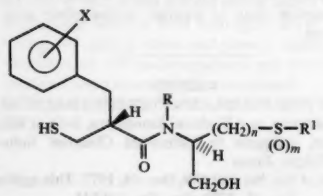
Filed May 18, 1981, Ser. No. 264,752
Int. Cl.³ C07C *149/41*
U.S. Cl. 562—426 **9 Claims**

1. A compound of the formula



(I)

or



(II)

wherein

X is hydrogen, $(C_1–C_3)$alkyl, $(C_1–C_3)$alkoxy, fluoro, chloro, bromo, or trifluoromethyl;

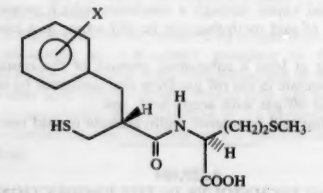
R is hydrogen or $(C_1–C_3)$alkyl;

n is 1 to 4,

m is 0, 1 or 2; and

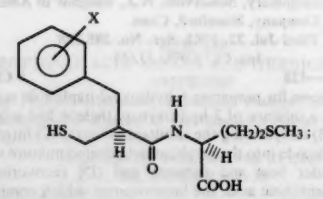
R^1 is $(C_1–C_3)$alkyl.

9. A compound of the formula



(III)

or



(IV)

or a pharmaceutically acceptable cationic salt thereof.

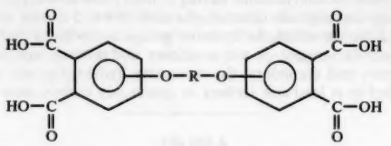
4,329,496

METHOD FOR MAKING AROMATIC BIS(ETHER PHTHALIC ACID) OR AROMATIC BIS(ETHER ANHYDRIDE)

Jimmy L. Webb, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,994
Int. Cl.³ C07D *307/89*; C07C *65/24*
U.S. Cl. 562—468 **15 Claims**

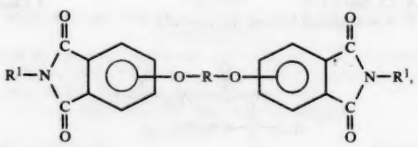
1. A biphasic imide-anhydride exchange process for making aromatic bis(ether phthalic acid) of the formula:



or the anhydride thereof which comprises:

(A) heating a mixture comprising:

(i) aromatic bis(ether phthalimide) of the formula:

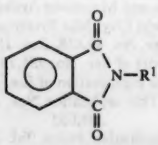


(ii) phthalic anhydride or phthalic acid.

(iii) an exchange catalyst.

(iv) water.

(v) a water-immiscible inert organic solvent to produce an equilibrated liquid biphasic reaction mixture, comprising an aqueous phase having selectively dissolved therein the aromatic bis(ether phthalic acid) formed in the exchange reaction, the catalyst, along with any excess phthalic acid, and an organic phase having selectively dissolved therein, N-organo substituted phthalimide of the formula:



which was also formed in the exchange reaction, together with any unreacted aromatic bis(ether phthalimide),

(B) separating the organic phase from the aqueous phase

(C) recovering the aromatic bis(ether phthalic acid) from the aqueous phase, and optionally dehydrating it to form the dianhydride, where R is a divalent aromatic radical having from 6–30 carbon atoms and R^1 is a monovalent organo radical selected from the class consisting of $C_{(1-8)}$ alkyl radicals, and organic radicals having from 6–20 carbon atoms selected from the class consisting of aromatic hydrocarbon radicals and halogenated derivatives thereof.

4,329,497

METHOD FOR THE PRODUCTION OF 4-HYDROXYPHENYLACETIC ACID

Normann Kaniss, and Adolf Bauer, both of Raubling, Fed. Rep. of Germany, assignors to Diamalt Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,673

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1978, 2807201

Int. Cl.³ C07C *65/01*

U.S. Cl. 562—478 **3 Claims**

1. A method for producing 4-hydroxyphenylacetic acid, which consists essentially of sequentially

(a) reacting o-chlorophenol with glyoxylic acid in an alkaline solution at a temperature of from −5° to 100° C. to form 3-chloro-4-hydroxymandelic acid after acidification,

(b) reducing the 3-chloro-4-hydroxymandelic acid by conventional means to 3-chloro-4-hydroxyphenylacetic acid, and

(c) cleaving the chloro group from the 3-chloro-4-hydroxyphenylacetic acid in alkaline solution at between room temperature and the boiling point of the reaction mixture.

4,329,498

PREPARATION OF 6-AMINOCAPROIC ACID VIA MUCONIC ACID MONONITRILE

Timothy R. Demmin, Grand Island, N.Y., and Milorad M. Rogic, Whippany, N.J., assignors to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 74,442, Sep. 11, 1979, Pat. No. 4,277,419, which is a continuation-in-part of Ser. No. 942,507, Sep. 15, 1978, abandoned. This application Mar. 13, 1981, Ser. No. 243,226

The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.

Int. Cl.³ C07C *51/31, 53/126, 120/00, 121/413*

U.S. Cl. 562—553 **17 Claims**

1. A process of producing 6-aminocaproic acid which comprises:

(a) reacting phenol, catechol or orthobenzoquinone with a copper(II)-ammonia reagent in the liquid phase under reaction conditions forming cis, cis-muconic acid mononitrile or a copper salt thereof,

(b) reacting the muconic acid mononitrile or copper salt thereof with hydrogen in the presence of a hydrogenation catalyst to form 6-aminocaproic acid;

said copper(II)-ammonia reagent being selected from the group consisting of

(i) a copper(II)-ammonia reagent prepared by the oxidation of a soluble cuprous salt in the presence of at least about equimolar amounts of ammonia or ammonium hydroxide;

(ii) a copper(II)-ammonia reagent prepared by the oxidation of a soluble cuprous salt with oxygen in an organic solvent having a nitrogen with an unshared electron pair and then adding ammonia or ammonium hydroxide in a molar amount at least twice the moles of cupric ion, and

(iii) a copper(II)-ammonia reagent suspended in an organic solvent having a nitrogen with an unshared electron pair, wherein the copper(II)-ammonia reagent, when recovered from the organic solvent, has an empirical formula

$$(CuO)(CuX_2)_y(NH_3)_z$$

where X is a monovalent anion, y is between about 0.2 and about 1 and z is between about 2 and about 4.

4,329,499

ALKYLDIPHENYL ETHER-SULPHONIC ACID HYDRAZIDES, THEIR PREPARATION AND THEIR USE AS BLOWING AGENTS

Walter Horstmann, and Knut Hammerström, both of Bergisch Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

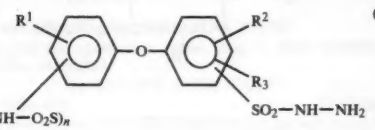
Filed Nov. 20, 1980, Ser. No. 208,760

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949069

Int. Cl.³ C07C *143/825*

U.S. Cl. 564—81 **8 Claims**

1. A di- or tri-sulphonic acid hydrazide of an alkylated diphenyl ether, said hydrazide being of the formula



(I)

wherein

R_1 and R_2 are identical or different and represent halogen or a lower alkyl radical and R_1 or R_2 can denote hydrogen,

R_3 denotes a lower alkyl radical and

n represents the number 1 or 2.

4,329,500

CATALYSTS FOR THE HYDRATION OF NITRILES TO AMIDES

Clarence E. Habermann, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 442,271, Feb. 13, 1974, abandoned, which is a division of Ser. No. 91,146, Nov. 19, 1970, abandoned. This application Aug. 7, 1978, Ser. No. 931,571

Int. Cl.³ C07C *102/08*

U.S. Cl. 564—128 **2 Claims**

1. In the process of hydrating a nitrile to the corresponding amide by contacting the nitrile in the presence of water with a catalyst, the improvement comprising using as catalyst unreduced cobalt oxide.

4,329,501

SYNTHESIS OF ALKYL AMINO BENZENES FROM ALKYL DIAMINO BENZENES

Barton Milligan, Coplay, and Roland E. Grandin, Alburtis, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 9, 1980, Ser. No. 195,565

Int. Cl.³ C07C *85/00, 85/20*

U.S. Cl. 564—305 **9 Claims**

1. In a process for producing a 1-alkyl amino benzene by the catalytic reduction of an alkyl amino benzene selected from the group consisting of 1-alkyl-2,3-diamino benzene and 1-alkyl-3,4-diamino benzene utilizing a cobalt catalyst, the improvement which comprises:

forming an aqueous phase containing said alkyl diamino benzene;

catalytically reducing said alkyl diamino benzene while in the aqueous phase by reacting said alkyl diamino benzene with hydrogen and thereby forming a water insoluble phase containing 1-alkyl amino benzene product and an organic phase containing unreacted alkyl diamino benzene, said reduction carried out in the absence of alkaline earth and alkali metal oxide or carbonate; and

separating the thus formed water insoluble phase containing 1-alkyl amino benzene product from the aqueous phase.

4,329,502

PROPRANOLOL ANTIGEN CONJUGATES AND ANTIBODIES

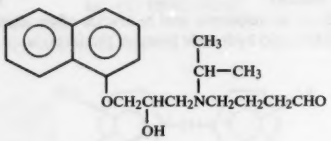
Prithipal Singh, Sunnyvale, and Marcel R. Pirio, San Jose, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 937,248, Aug. 28, 1978, Pat. No. 4,241,177. This application Aug. 7, 1980, Ser. No. 175,977

Int. Cl.³ C07C *93/06*

U.S. Cl. 564—349 1 Claim

1. A compound of the following formula:



4,329,503

PROCESS FOR THE PREPARATION OF 2-AMINO-4-NITROPHENOL

Wolfgang Bauer, Maintal, and Klaus Kühlein, Kelkheim, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 19, 1981, Ser. No. 226,120

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1980, 3002254

Int. Cl.³ C07C *89/00, 85/11*

U.S. Cl. 564—418 10 Claims

1. In the process for preparation of 2-amino-4-nitrophenol by reduction of 2,4-dinitrophenol with a hydrosulfide in aqueous alkaline solution at temperatures from 20° to 100° C., the improvement comprises maintaining the pH value at 7 to 9.5 during the reduction.

4,329,504

METAPHENYLENEDIAMINES

Andree Bugaut, 7 rue des Abondances, 92 Boulogne, Seine, and Jean-Jacques Vandenbossche, 6 rue Leon Richet, 93601 Aulnay, Bois, both of France

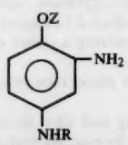
Continuation-in-part of Ser. No. 22,615, Mar. 21, 1979, Pat. No. 4,259,261, which is a continuation-in-part of Ser. No. 826,069, Aug. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 722,819, Sep. 13, 1976, Pat. No. 4,125,367. This application Oct. 1, 1980, Ser. No. 192,699

Claims priority, application France, Aug., 1976, 76 25387

Int. Cl.³ C07C *91/40, 93/08, 93/14*

U.S. Cl. 564—443 7 Claims

1. A compound having the formula



or an acid salt thereof, wherein R is hydrogen, C_1–C_3 alkyl or C_1–C_3 hydroxyalkyl, and Z is hydroxyalkyl wherein the alkyl moiety has 2 or 3 carbon atoms or alkoxyalkyl wherein the alkoxy moiety contains 1 to 2 carbon atoms and the alkyl moiety has 2 or 3 carbon atoms, with the proviso that Z is not hydroxyethyl when R is hydrogen.

4,329,505

PREPARATION OF POLYMERIC REACTION PRODUCTS OF ALKOXYALKYLAMINES AND EPIHALOHYDRINS

Gary W. Y. Kwong, Racine, Wis., and Joseph Levy, Deerfield Beach, Fla., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 92,384, Nov. 8, 1979, Pat. No. 4,252,745. This application Oct. 15, 1980, Ser. No. 197,033

Int. Cl.³ C07C *85/04, 89/02*

U.S. Cl. 564—476 8 Claims

1. The process of making a polymeric reaction product which comprises reacting one molar proportion of an alkoxyalkylamine with from about 0.5 to about 2.0 molar proportions of an epihalohydrin selected from the group consisting of epichlorohydrin, 1-halo-3,4-epoxybutane, 1-halo-2,3-epoxybutane, 1-halo-4,5-epoxypentane, and 1-halo-3,4-epoxypentane, at a temperature from about 40° C. to about 150° C., thereafter reacting the resultant adduct with an inorganic base at said temperature, and recovering the polymeric reaction product.

4,329,506

ISOMERIZATION OF ALDEHYDES TO KETONES

Louis J. Velenyi, Lyndhurst, and Andrew S. Krupa, Twinsburg, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 28, 1980, Ser. No. 182,282

Int. Cl.³ C07C *45/51*

U.S. Cl. 568—310 7 Claims

1. A process of isomerizing aldehydes to ketones, the process comprising contacting at isomerization conditions an aldehyde with a catalyst of the formula

$$Mo_{0.15\text{-}15}\,M'_{0.05\text{-}12}\,O_x \qquad (I)$$

where

M is a combination of Mo and Cu,

M′ is tin, and

x is the number of oxygen atoms determined by the valence requirements of the other elements present,

with the proviso that the mole quotient of M/M′ is greater than or equal to 1.

4,329,507

SUBSTITUTED ARYL ETHYLENES

Makoto Takeda; Masayuki Uchide, and Hiroshi Iwane, all of Amimachi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

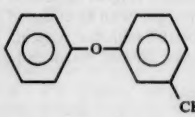
Division of Ser. No. 909,643, May 25, 1978, abandoned, which is a division of Ser. No. 734,592, Oct. 21, 1976, abandoned. This application Jan. 14, 1980, Ser. No. 111,978

Claims priority, application Japan, Oct. 23, 1975, 50/127787; Jul. 31, 1976, 51/91523

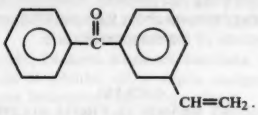
Int. Cl.³ C07C *49/794*

U.S. Cl. 568—332 3 Claims

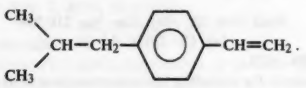
1. The compound of the formula



2. The compound of the formula



3. The compound of the formula



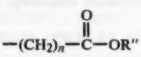
4,329,508

PROCESS FOR MAKING ALKYL CYCLOPENTENONES

T. L. Ho, Jacksonville, and Shing-Hou Liu, Atlantic Beach, both of Fla., assignors to SCM Corporation, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,083
Int. Cl.[3] C07C *45/52*
U.S. Cl. 568—361 20 Claims

1. A process for producing substituted 2-cyclopenten-1-ones from a corresponding substituted cyclopentadiene which comprises the steps of forming a mixture of epoxy substituted cyclopentenes by reaction with a peroxyacid, hydrolyzing said mixture of epoxy substituted cyclopentenes with water to form a mixture of dihydroxy-substituted cyclopentenes and dehydrating said dihydroxy substituted cyclopentenes in the presence of an acid to form a mixture containing 2-, and 3-substituted-2-cyclopenten-1-ones, and wherein the substituted group is selected from C_1–C_{10} alkyl groups and substituted C_1–C_{10} alkyl groups having the general formula:



wherein R" is a C_1–C_{10} alkyl group and n is an integer from 1–9.

4,329,509

CO-PRODUCTION OF 2-ALKANONES AND PHENOLS

Werner O. Haag, Lawrenceville, and Lewis B. Young, Skillman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 99,344, Nov. 30, 1979, abandoned. This application Jan. 22, 1981, Ser. No. 227,339
Int. Cl.[3] C07C *45/53, 37/08*
U.S. Cl. 568—385 11 Claims

1. A method for co-producing 2-alkanones of at least five carbon atoms and phenolic compounds, said method comprising

(A) producing arylalkane compounds enriched in the 2-arylalkane isomer, wherein the alkyl moiety has at least five carbon atoms therein, by a process comprising:

(i) reacting an aromatic compound with an alkylating agent in the presence of a selective crystalline zeolite material, said alkylating agent comprising an aliphatic or aromatic organic compound having one or more available reactive alkyl groups of at least five carbon atoms in the linear hydrocarbon chain and said selective crystalline zeolite being characterized by a crystal structure having channels or networks of pores therethru, the major dimension of the openings to such channels or pores being between about six and about seven angstroms;

(ii) said reaction being carried out at a temperature of between about 50° C. and about 500° C. and a pressure within the approximate range of 2.5×10^4 N/m^2 to 2.5×10^7 N/m^2;

(B) oxidizing said 2-arylalkane isomer with an oxidizing agent to produce the hydroperoxide thereof; and

(C) cleaving and rearranging said hydroperoxide by contacting said hydroperoxide with an inorganic acid or a cation exchange resin to yield a 2-alkanone of substantially the same carbon chain length as the alkyl moiety and a phenolic compound.

4,329,510

PROCESS FOR PURIFYING KETONES

Kazutoyo Uno, and Hisaya Miki, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,737
Claims priority, application Japan, Aug. 7, 1979, 54-99902; Sep. 3, 1979, 54-111723
Int. Cl.[3] C07C *49/04, 49/20*
U.S. Cl. 568—411 11 Claims

1. In a process for recovering a purified ketone substantially free from aldehydes which comprises contacting a crude ketone containing small amounts of aldehydes with an alkali and then distilling the treated crude ketone, the improvement wherein said alkali is a solid alkali composition composed of an alkali metal compound selected from alkali metal oxides and hydroxides, an alkaline earth metal compound selected from alkaline earth metal oxides and hydroxides and silicon dioxide in which the mole ratio of the alkali metal to the alkaline earth metal is in the range of from 1:1 to 1:15, and the mole ratio of the alkali metal to silicon is in the range of from 1:0.25 to 1:5.

4,329,511

HYDROFORMYLATION PROCESS IMPROVED BY CHOICE OF REACTION SOLVENT AND CONTROL OF PRODUCT STRIPPING PARAMETERS

Edward B. Hackman, Corpus Christi; Larry D. Zeagler, Pampa; James S. McLaughlin, Corpus Christi, and Carl M. Peabody, Louisville, all of Tex., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 49,998, Jun. 18, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 161,827
Int. Cl.[3] C07C *45/50, 47/02*
U.S. Cl. 568—454 11 Claims

1. In a process for hydroformylating an olefin of 2 to about 20 carbon atoms having an ethylenic double bond in the alpha position by reacting said olefin at about 80° C. to 150° C. and superatmospheric pressure with carbon monoxide and hydrogen in admixture with a liquid reaction medium comprising a high-boiling inert reaction solvent containing an effective amount of a hydroformylation catalyst comprising a Group VIII metal in complex combination with a monodentate or polydentate ligand comprising triorganophosphine, triorganophosphite, triorganoarsine, or triorganostibine moiety to form a liquid reaction product mixture comprising said ligand, an aldehyde derivative of said olefin, and said highboiling inert reaction solvent while continuously stripping said liquid reaction product mixture by distillation, evaporation, or gas stripping to recover vapors comprising said aldehyde therefrom, the improvement which comprises:

(a) employing as said high-boiling inert reaction solvent a liquid which has a molecular weight of at least about 700 and which is a solvent for said catalyst and said olefin, said solvent being incorporated into said liquid reaction medium in a proportion of about 40% to 95% by weight, and

(b) controlling the rate of stripping at a level such that, when the olefin is ethylene, the concentration of propionaldehyde maintained in the liquid reaction product mixture is about 1 to 2 gram moles per liter or, when the olefin is propylene or a higher alkene, the maintained concentration of the sum of the corresponding normal and iso-alde-

hyde hydroformylation derivatives is about 1 to 2 gram moles per liter.

4,329,512

PROCESS FOR PREPARING ACETALDEHYDE

David Moy, Ridgewood, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,330
Int. Cl.[3] C07C 47/06, 45/41
U.S. Cl. 568—484 4 Claims

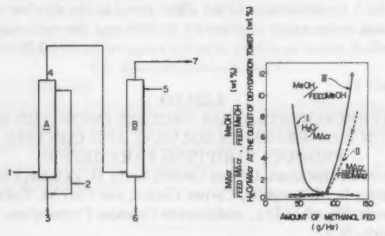
1. A process for the preparation of acetaldehyde which comprises reacting acetic anhydride with hydrogen in the presence of a Group VIII noble metal catalyst wherein the reaction is carried out in the liquid phase but the reaction mixture is maintained under boiling conditions and the entire reaction effluent is in vapor form.

4,329,513

METHOD FOR DEHYDRATION OF UNSATURATED ALDEHYDE-CONTAINING GAS

Atsushi Aoshima, Yokohama; Ryoichi Mitsui, and Toshiaki Kaneko, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyl Kabushiki Kaisha, Osaka, Japan

Filed Dec. 5, 1980, Ser. No. 213,703
Claims priority, application Japan, Dec. 19, 1979, 54/164098
Int. Cl.[3] C07C 45/58, 47/20
U.S. Cl. 568—492 5 Claims



1. A method for dehydrating an unsaturated aldehyde-containing gas, which comprises allowing methanol to flow downwardly and contacting the same countercurrently at a temperature within the range of 0° C. to 90° C. and at a pressure close to normal with an unsaturated aldehyde-containing gas produced from gas phase catalytic oxidation of a starting gas comprising at least one gas selected from the group consisting of propylene, isobutylene and t-butanol, said methanol being supplied in such an amount from 10 g to 1 kg per 1 m^3 of the unsaturated aldehyde-containing gas that substantially all the methanol can be gasified in the treatment.

4,329,514

METHOD FOR CONTROLLING RUNAWAY DECOMPOSITION IN THE PREPARATION OF HYDROCARBON HYDROPEROXIDES

Ludovicus B. J. O. van der Weijst, Klundert; Enno B. De Vries, and Gerard J. Heiszwolf, both of Amsterdam, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 19, 1981, Ser. No. 225,939
Claims priority, application Netherlands, Jan. 21, 1980, 8000363
Int. Cl.[3] C07C 179/02
U.S. Cl. 568—577 7 Claims

1. In the preparation of a hydrocarbon hydroperoxide by reacting in an oxidation reaction mixture a hydrocarbon with molecular oxygen at an elevated temperature, the process for management of runaway decomposition in the reaction mixture which comprises the steps of sensing the onset of runaway decomposition and in response thereto adding to the reaction mixture in a substantially instantaneous manner a quantity of base effective to bring the runaway under control, said quantity of base being between about 0.05 and 20 gram-equivalents per 1000 kilograms of the reaction mixture.

4,329,515

CATALYST REMOVAL FROM ALCOHOL ALKOXYLATES

Kang Yang; Gerald L. Nield, and Paul H. Washecheck, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Nov. 28, 1980, Ser. No. 210,994
Int. Cl.[3] C07C 41/34
U.S. Cl. 568—621 1 Claim

1. A method for reducing barium containing and strontium containing residues to levels below about 40 parts per million in alcohol alkoxylate products containing said residue, the method comprising

(a) adding an organic acid selected from the group consisting of glutaric, tartaric, oxalic, succinic, diglycolic, adipic, azelaic, sebasic, citric, itaconic, subseric, malic, malonic and fumaric, or mixtures of these of a temperature of from about 0° C. to about 150° C.;

(b) allowing an insoluble barium containing or strontium containing percipitate to form, then

(c) separating the precipitate from the alcohol alkoxylate by filtration, centrifugation or a combination of these.

4,329,516

PROCESS FOR THE PRODUCTION OF METHYL T-BUTYL ETHER

Ghazi R. Al-Muddarris, Cologne, Fed. Rep. of Germany, assignor to Davy International Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 3, 1980, Ser. No. 156,040
Claims priority, application Fed. Rep. of Germany, May 28, 1979, 2921576
Int. Cl.[3] C07C 41/05
U.S. Cl. 568—697 8 Claims

1. In a process for the production of methyl tert.-butyl ether from a mixture of light hydrocarbons containing butane or butanes, whereby (i) the butane fraction is separated from the mixture, (ii) n-butane of the butane fraction is isomerised to form isobutane, (iii) the isobutane is dehydrogenated to form a dehydrogenation mixture having an isobutene/isobutane molar ratio in the range from 0.4 to 2:1, (iv) isobutene contained in the dehydrogenation mixture is etherified with methanol to form methyl tert.-butyl ether, and (v) the isobutane from the etherification mixture is separated and recycled to the dehydrogenation step; the improvement which comprises:

(a) separating the butane fraction and the isomate obtained with the isomerisation of the n-butane into an n-butane fraction and an isobutane fraction by means of distillation;

(b) passing the resulting n-butane fraction to the isomerisation step;

(c) dehydrogenating the resulting isobutane fraction which, together with said isobutane separated and recycled from the etherification mixture, has an isobutane content of from about 70% to 100% by weight, to thereby form the dehydrogenation mixture;

(d) separating from the resulting dehydrogenation mixture a mixture consisting essentially of all the isobutane and isobutene, by means of absorption and desorption separation techniques, which separated isobutene/isobutane mixture is thereafter reacted with methanol to form the etherification mixture comprising methyl tert.-butyl ether and isobutane; and

(e) thereafter separating substantially all of the isobutane from the etherification mixture by distillation, which isobutane is recycled to the dehydrogenation step.

4,329,517
PROCESS FOR PRODUCTION OF MONO- OR DI-ORTHO-METHYL-SUBSTITUTED PHENOLS BY CATALYTIC METHYLATION AND CATALYST THEREFOR

Katsuo Taniguchi, Iwakuni; Kazunori Takahata, and Yoshiaki An-Nen, both of Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

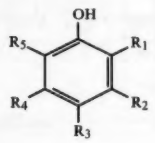
Filed May 14, 1980, Ser. No. 149,583

Claims priority, application Japan, May 16, 1979, 54-59078; Sep. 14, 1979, 54-117229; Oct. 12, 1979, 54-130912; Oct. 29, 1979, 54-138705; Nov. 6, 1979, 54-142789; Nov. 6, 1979, 54-142790; Nov. 7, 1979, 54-143335

Int. Cl.³ C07C *37/11*

U.S. Cl. 568—804 **5 Claims**

1. In a process for producing a mono- or di-orthomethyl-substituted phenol which comprises methylating a phenol having the following formula



wherein each of R_1, R_2, R_3, R_4 and R_5 represents a member selected from the group consisting of hydrogen, lower alkyl, cyclohexyl and phenyl, provided that one or both R_1 and R_5 are hydrogen atoms,

with methanol, in a vapor phase reaction at a temperature of about 250° to about 450° C. and a pressure of about 1 to about 30 kg/cm^2-gauge, in the presence of a catalytic amount of a catalyst comprising (A) a major proportion of an oxide of iron and (B) a minor proportion of at least one oxide of a metal other than iron, the improvement wherein said metal other than iron in component (B) is a metal selected from the group consisting of Ga, Ge, Y, Nb, Hf, Bi and Ta, and the amount of component (B) is about 0.003 to about 0.3 gram-atom, as metal, per gram-atom of iron.

4,329,518
INSECTICIDAL [1,1'-BIPHENYL]-3-YLMETHYL ESTERS

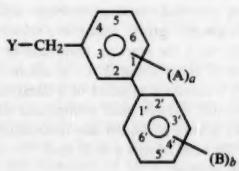
Ernest L. Plummer, North Tonawanda, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 76,636, Sep. 18, 1979, abandoned, which is a division of Ser. No. 966,405, Dec. 4, 1978, Pat. No. 4,214,004. This application Oct. 2, 1980, Ser. No. 193,056

Int. Cl.³ C07C *33/18*

U.S. Cl. 568—807 **19 Claims**

1. A substituted [1,1'-biphenyl]-3-ylmethyl compound of the formula



wherein Y is hydroxyl, methanesulfonate, p-toluenesulfonate, chloro, bromo, and

(1) b is 0, a is 1–4, and
when a is 1,
A is 2- or 6-halo, 4-chloro, 4-fluoro, 5-fluoro, 2-lower alkyl, or 2-trifluoromethyl, and
when a is 2,
A is fluoro, 2 and 4-substituents independently selected from fluoro, chloro, bromo, and lower alkyl, with the proviso that only one may be bromo or alkyl other than methyl, or 2 and 6-substituents independently selected from fluoro, chloro and methyl and
when a is 3 or 4,
A is fluoro, or may be as when a is 1 or a is 2 with one or two additional fluoro groups; or

(2) a is 0, b is 1–5, and
when b is 1,
B is halo, 2' or 3'-lower alkyl, 2' or 3'-trifluoromethyl, or 2' or 3'-lower alkoxy, and
when b is 2,
B is fluoro, or 2' and 4'-substituents independently selected from fluoro, chloro and bromo, and
when b is 3, 4 or 5,
B is fluoro; or

(3) a is 1–4, b is 1–4, and
A is fluoro or a 2-substituent selected from chloro, bromo, and lower alkyl with 0 to 3 fluoro groups, and
B is fluoro or a 2'-substituent selected from chloro and methyl with 0 to 3 fluoro groups.

4,329,519
PROCESS FOR THE PURIFICATION OF PENTAERYTHRITOL

Peter Werle, Gelnhausen, and Gerhard Pohl, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,445

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930345

Int. Cl.³ C07C *29/76, 31/24*

U.S. Cl. 568—854 **7 Claims**

1. A process for the separation of bis pentaerythritol monoformal from crude pentaerythritol containing bis pentaerythritol monoformal in an amount above 0.1% comprising subjecting the crude pentaerythritol in solid form to a temperature of 160° to 200° C. for 15 to 60 minutes until the amount of bis pentaerythritol monoformal present is reduced to below 0.1%.

4,329,520
PROCESS AND CATALYST FOR OLEFIN HYDRATION

Percy R. Kavasmaneck; David B. Stanton, and Paul D. Sherman, Jr., all of South Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 132,496, Mar. 21, 1980, Pat. No. 4,297,241. This application Feb. 27, 1981, Ser. No. 238,842

Int. Cl.³ C07C *29/04*

U.S. Cl. 568—896 **6 Claims**

1. Method of hydrating lower olefins selected from the class consisting of ethylene, propylene, butene-1 and butene-2 which comprises reacting olefin with water vapor in the presence of a hydration catalyst at a temperature within the range of about 220° to about 300° C., a water vapor to olefin mole ratio of about 0.3 to 1.0, and an operating reaction pressure of about 500 to about 1200 psig; said catalyst having been prepared by:

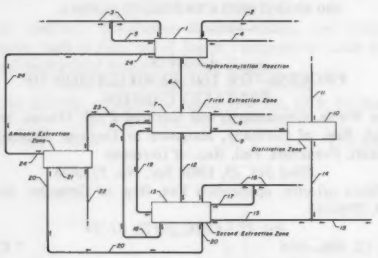
(1) blending a mixture of about 30 to about 70 parts by weight of diatomaceous earth, about 15 to about 30 parts by weight of bentonite, about 15 to about 30 parts by weight of a synthetic silica having a surface area of about 150 to about 200 meters^2 per gram, about 5 to about 25 parts by weight of cornmeal and about 5 to about 25 parts by weight of cellulose with sufficient water to form a paste;
(2) extruding the paste from step 1 into pellets;
(3) drying said pellets;
(4) calcining said dried pellets at a temperature of about 650° to about 730° C.;
(5) leaching the calcined pellets with aqueous 85 percent phosphoric acid until metallic impurities are reduced to a minimum;

(6) washing the leached pellets with water until the wash water is approximately neutral;
(7) drying the pellets;
(8) impregnating the dried pellets with 65 percent phosphoric acid at room temperature;
(9) draining off excess phosphoric acid;
and
(10) drying the pellets at a temperature of about 100° to about 400° C.;

4,329,521
OXO ALCOHOL SYNTHESIS WITH RHODIUM CATALYST RECYCLE

Edwin H. Homeier, Maywood; Tamotsu Imai, Mt. Prospect; David E. Mackowiak, Des Plaines, and Catherine E. Guzolek, Park Ridge, all of Ill., assignors to UOP Inc., Des Plains, Ill.

Continuation of Ser. No. 138,819, Apr. 9, 1980, abandoned. This application Mar. 3, 1981, Ser. No. 239,960
Int. Cl.³ C07C *27/22*
U.S. Cl. 568—909 **16 Claims**



1. A process for the synthesis of an alcohol which comprises the steps of:
(a) treating an olefinic hydrocarbon having at least 3 carbon atoms with carbon monoxide and hydrogen in a hydroformylation zone at hydroformylation reaction conditions in the presence of a rhodium complex catalyst and an amine modifier to form an alcohol;
(b) extracting said rhodium complex catalyst from the resulting alcohol by extraction with an aqueous ammonium hydroxide solution at extraction conditions to obtain an organic phase containing the alcohol and amine and an aqueous ammonium hydroxide solution phase containing the rhodium complex catalyst;
(c) separating the product alcohol and amine modifier from said aqueous ammonium hydroxide solution containing said catalyst;
(d) separating and recovering said alcohol from said amine modifier;
(e) extracting said rhodium complex catalyst from said aqueous ammonium hydroxide solution at extraction conditions in the presence of carbon monoxide using said amine modifier as the extractant; and
(f) recycling the rhodium complex catalyst and amine modifier to said hydroformylation zone.

4,329,522
1,3,5,7-TETRANITROADAMANTANE AND PROCESS FOR PREPARING SAME

Everett E. Gilbert, Morristown, N.J., and Gilbert P. Sollott, Plymouth Meeting, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 14, 1980, Ser. No. 196,956
Int. Cl.³ C07C *79/08, 76/02*
U.S. Cl. 568—941 **4 Claims**

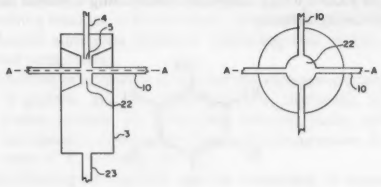
1. As a new composition of matter, 1,3,5,7-tetranitroadamantane.

2. A process for preparing 1,3,5,7-tetranitroadamantane which comprises reacting 1,3,5,7-tetraaminoadamantane with an oxidizing agent.

4,329,523
PROCESS FOR THE NITRATION OF METHANE

Richard L. James, Monroe, La., and Richard S. Egly, West Terre Haut, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Sep. 2, 1980, Ser. No. 182,872
Int. Cl.³ C07C *76/02, 79/04*
U.S. Cl. 568—948 **6 Claims**



1. An improved process for the single-stage nitration of methane in the vapor phase comprising (a) heating the methane to a temperature in the range of 1000° to 1250° F., (b) injecting the methane into a reactor through the throat of a Venturi, (c) simultaneously injecting dilute nitric acid through a plurality of orifices into the Venturi throat and perpendicularly to the methane flow, (d) reacting the methane and nitric acid at a temperature of about 800° F. to about 1000° F. or more for a reaction time of 250 to 30 milliseconds, respectively.

4,329,524
SEPARATION OF 3,5-DICHLOROCUMENE FROM A MIXTURE OF 3,5-DICHLOROCUMENE AND 2,4-DICHLOROCUMENE

James R. Dewald, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 51,091, Jun. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 903,423, May 8, 1978, abandoned. This application Mar. 12, 1980, Ser. No. 129,514
Int. Cl.³ C07C *17/38*
U.S. Cl. 570—190 **7 Claims**

1. A process for separating 3,5-dichlorocumene from a starting mixture comprising 3,5-dichlorocumene and 2,4-dichlorocumene, which comprises:
(a) contacting the said starting mixture with at least one aromatic isopropyl group acceptor, which is essentially non-reactive with the starting materials or products, at a temperature of from about 0° C. to about 100° C., in the presence of a catalytic amount of a catalyst comprising:
(1) at least one Lewis acid compound of the formula $AlCl_mBr_n$ where m and n are individually integers of 0–3 and the sum of m+n is 3, and
(2) a proton source,
such that the isopropyl group of 2,4-dichlorocumene is preferentially transferred, as compared to the isopropyl group of 3,5-dichlorocumene, to the acceptor thereby forming a reaction product comprising the acceptor bearing said isopropyl group, 3,5-dichlorocumene and m-dichlorobenzene; and
(b) separating 3,5-dichlorocumene from the said reaction product.

4,329,525
PRODUCTION OF CHLORINATED COMPOUNDS BY USE OF MOLTEN SALTS

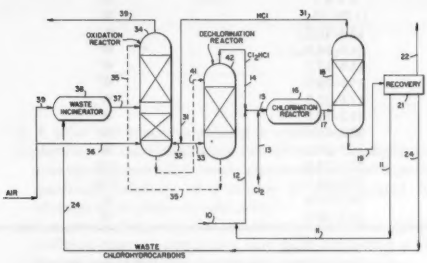
Herbert Riegel, Maplewood; Vincent Strangio, Glen Ridge, and Morgan C. Sze, Upper Montclair, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Feb. 21, 1978, Ser. No. 879,802

The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.

Int. Cl.³ C07C *17/00*

U.S. Cl. 570—191 **13 Claims**



1. A process for chlorinating a compound which is either a hydrocarbon or partially chlorinated hydrocarbon, comprising:

(a) contacting in a chlorination zone said (a) compound with fresh feed chlorine and a recycle mixture containing chlorine and hydrogen chloride to produce an effluent containing chlorinated product and hydrogen chloride;

(b) recovering chlorinated product and hydrogen chloride;

(c) introducing a first portion of recovered hydrogen chloride into an oxidation reaction zone wherein the hydrogen chloride is contacted with a molten salt mixture containing the higher and lower valent chlorides of a multivalent metal and oxygen to recover chlorine by enriching the higher valent metal chloride content of the molten salt;

(d) passing molten salt from the oxidation reaction zone to a dechlorination zone wherein the molten salt is contacted with a second portion of recovered hydrogen chloride, as stripping gas, to strip chlorine from the molten salt; and

(e) withdrawing from the dechlorination zone a mixture of chlorine and hydrogen chloride for introduction into the chlorination zone as said recycle mixture.

4,329,526
CHLORINATION METHOD

Melvin R. Bagley; Burton B. Crocker, and John F. Pysz, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 106,798, Dec. 26, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,514

Int. Cl.³ C07C *17/15*; F26B *17/00*

U.S. Cl. 570—203 **8 Claims**

1. In a method of chlorinating a member of the group consisting of aliphatic hydrocarbons having 1 to 2 carbon atoms, their incompletely chlorinated derivatives and benzene by passing a member of the group to be chlorinated, oxygen and a chlorinating agent selected from the group consisting of chlorine, HCl and mixtures of chlorine and HCl in the vapor phase through a fluidized bed of metal halide catalyst particles, the improvement comprising fluidizing the particles by employing a gas distribution system comprising in combination:

(a) a generally cup-shaped container having a generally circular unobstructed mouth portion defined by an outer lip portion and a base portion;

(b) pressurized gas introduction means for the introduction of the gas within the container substantially vertically through a tube directed toward the base portion;

(c) a generally inverted cone-shaped gas distributor having a truncated apex defining a generally circular opening;

(d) means for holding the outer lip portion of the container in a periferally closed relationship with the opening defined by the truncated apex of the cone-shaped distributor;

so that when in an operating mode the metal halide catalyst particles are distributed uniformly and suspended generally above the cone-shaped distributor by the pressurized gas.

4,329,527
PROCESS FOR THE MANUFACTURE OF 1,2-DICHLOROETHANE

Wenzel Kühn; Josef Riedl, both of Burgkirchen, and Peter Widmann, Altötting, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,362

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1979, 2949530

Int. Cl.³ C07C *17/15*

U.S. Cl. 570—245 **11 Claims**

1. A process for the manufacture of 1,2-dichloroethane by reaction of ethylene with chlorine, hydrogen chloride and oxygen or oxygen-containing inert gases, at 180° to 260° C. and a pressure of from 0.09 to 1.1 MPa, in the presence of a copper-containing fixed bed catalyst, in a reaction zone containing surfaces capable of being heated and cooled; the gaseous reaction mixture being removed from the reaction zone after passage through the fixed bed catalyst, cooled, and the 1,2-dichloroethane formed being separated according to known methods; which comprises introducing into the reaction zone ethylene, chlorine and oxygen or oxygen-containing inert gases before the fixed catalyst bed, and hydrogen chloride either at the same place as said other gases or in the first third of the fixed catalyst bed at the latest, in the following quantitative ratio: 1 mol C_2H_4 :0.35 to 0.7 mol Cl_2:0.7 to 1.4 mol HCl:0.2 to 0.6 mol O_2.

4,329,528
METHOD OF DEFOAMING CRUDE HYDROCARBON STOCKS WITH FLUOROSILICONE COMPOUNDS

Edwin R. Evans, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 1, 1980, Ser. No. 211,961

Int. Cl.³ C07C *7/20*; C10L *1/28*; B01D *19/04*; B01B *1/04*

U.S. Cl. 585—3 **22 Claims**

1. A method for defoaming crude hydrocarbon stock composition, adding at least 1 part per million of a linear fluoro alkyl organo polysiloxane copolymer having a viscosity from 400 to 1,000,000 centipoise at 25° C. where the copolymer has from 20 to 70 mole percent of fluoroalkyl, organo siloxy units and where the organo group is a monovalent hydrocarbon radical.

10. A defoamed hydrocarbon stock composition comprising 100 parts by weight of a hydrocarbon stock and at least 1 part per million of a linear fluoroalkyl organopolysiloxane copolymer having viscosity from 400 to 1,000,000 centipoise at 25° C. where the copolymer has from 20 to 70 mole percent of fluoroalkyl, organosiloxy units and where the organo group is a monovalent hydrocarbon radical.

4,329,529
TRACTION FLUIDS FOR TRACTION DRIVE TRANSMISSIONS

Masao Nambu, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 75,301, Sep. 12, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,800

Claims priority, application Japan, Sep. 19, 1978, 53/114103; Sep. 20, 1978, 53/114542

Int. Cl.³ C07C *13/00*

U.S. Cl. 585—20 **22 Claims**

1. In a traction drive transmission having a traction fluid, the

improvement in which said traction fluid comprises at least one compound selected from the group consisting of α-cyclohexyl-α-methyl-cyclohexylethane and α-cyclohexyl-α-dimethylcyclohexylethane and mixtures thereof, the at least one compound being obtained by hydrogenating at least one compound selected from the group consisting of α-phenyl-α-tolylethane and α-phenyl-α-(dimethylphenyl) ethane as alkaylation products of (A) at least one member selected from the group consisting of xylene and toluene and mixtures thereof, and (B) styrene.

4,329,530

HYDROGENATION CATALYST AND PROCESS FOR THE SELECTIVE HYDROGENATION OF HIGHLY UNSATURATED HYDROCARBONS

Elizabeth A. Irvine, Guisborough, and Martyn V. Twigg, Yarm, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 17, 1980, Ser. No. 207,709

Claims priority, application United Kingdom, Nov. 20, 1979, 40086/79; Jul. 15, 1980, 23061/80

Int. Cl.³ C07C *7/167*; B01J *21/04, 23/58*

U.S. Cl. 585—259 **10 Claims**

1. A material suitable for use as a catalyst for the selective hydrogenation of highly unsaturated hydrocarbons in the presence of less unsaturated hydrocarbons consisting essentially of palladium supported on shaped pieces of a calcined refractory composition consisting essentially of calcium aluminate cement as such or with additional alumina, said composition having a calcium:aluminum atomic ratio within the range 1:4 to 1:10, the average depth of penetration of the palladium into the shaped pieces being less than 300 μm.

4,329,531

HYDROALKYLATION CATALYST AND METHODS FOR PRODUCING AND EMPLOYING SAME

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1980, Ser. No. 154,548

Int. Cl.³ C07C *5/12*

U.S. Cl. 585—268 **22 Claims**

1. In a process comprising contacting an aromatic hydrocarbon feedstock under hydroalkylation conditions with a catalyst consisting essentially of a calcined, acidic, nickel and rare-earth exchanged crystalline zeolite, to produce a cycloalkyl aromatic product, the improvement comprising employing a catalyst which was calcined at a temperature which did not exceed 400° C.

4,329,532

PROCESS FOR THE PREPARATION OF AROMATIC HYDROCARBON MIXTURE

Paul J. Conn, Houston, Tex., and Martin F. M. Post, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 10, 1980, Ser. No. 128,416

Claims priority, application Netherlands, Mar. 14, 1979, 7902019

Int. Cl.³ C10G *35/095*

U.S. Cl. 585—407 **3 Claims**

1. A process for the preparation of an aromatic hydrocarbon mixture, which comprises contacting as feed a C_{4-} monoolefin or a hydrocarbon mixture which consists of more than 75%w C_{4-} monoolefins, at temperature in the range from 350° to 550° C. and a pressure in the range from 3 to 20 bar and a space velocity from 1 to 20 bar and a space velocity from 1 to 20 $g.g^{-1}h^{-1}$ in a contact zone with a catalyst consisting essentially of a crystalline silicate, which silicate is characterized by having the following properties after 1 hour's calcining in air at 500° C.:

(a) thermally stable up to a temperature above 600° C., p1 (b) an X-ray powder diffraction pattern showing, inter alia, the reflections given in Table A:

TABLE A

Radiation: Cu—Kα 2θ	Wavelength 0.15148 nm relative intensity
7.8–8.2	S
8.7–9.1	M
11.08–12.1	W
12.4–12.7	W
14.6–14.9	W
15.4–15.7	W
15.8–16.1	W
17.6–17.9	W
19.2–19.5	W
20.2–20.6	W
20.7–21.1	W
23.1–23.4	VS
23.8–24.1	VS
24.2–24.8	S
29.7–30.1	M

wherein the letters used have the following meanings:
VS=very strong; S=strong; M=moderate; W=weak;
θangle according to Bragg's law,

(c) after conversion of the silicate into the H-form and after evacuation at 2×10^{-9} bar and 400° C. for 16 hours and measured at a hydrocarbon pressure of 8×10^{-2} bar and 100° C., the adsorption of n-hexane is at least 0.8 mmol/g, the adsorption of 2,2-dimethylbutane is at least 0.5 mmol/g and the ratio

$$\frac{\text{adsorption of n-hexane}}{\text{adsorption of 2,2-dimethylbutane}} = \text{at least 1.5,}$$

(d) the composition expressed in moles of the oxides is as follows: $y.(1.0\pm0.3)M_{n/2}O.y.Al_2O_3.SiO_2$, wherein M=H and/or alkali metal and/or alkaline-earth metal, n is the valency of M and $0.0075 \geqq y \geqq 0.0030$, and

(e) an average crystallite size (d)≦500 nm, and withdrawing an aromatic hydrocarbon mixture product from said contact zone.

4,329,533

SHAPE SELECTIVE REACTIONS WITH ZEOLITE CATALYSTS MODIFIED WITH GROUP IA METALS

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1980, Ser. No. 146,951

Int. Cl.³ C07C *2/68*

U.S. Cl. 585—466 **29 Claims**

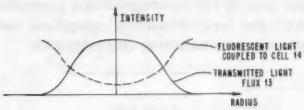
1. A process for conversion of organic compounds, said process comprising contacting said organic compounds with a crystalline zeolite catalyst at a temperature of between about 250° C. and about 750° C. and a pressure within the approximate range of $10^5N/m^2$ to $10^7N/m^2$, said zeolite being characterized by a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, said zeolite having undergone prior modification by initial treatment to replace the original cations therein with hydrogen or a hydrogen precursor and by subsequent treatment with one or more compounds containing metal elements of Group IA to deposit on said zeolite at least 0.25 weight percent of such element in the form of its oxide.

4,329,534

UNIFORM INCIDENT LIGHT HIGH VOLTAGE SOLAR CELL ARRAY

Rodney T. Hodgson, Ossining, and Harold J. Hovel, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 107,947, Dec. 28, 1979, abandoned.
This application Feb. 17, 1981, Ser. No. 234,298
Int. Cl.[3] H01L *31/04*
U.S. Cl. 136—247 4 Claims



1. A solar cell array comprising in combination:

a plurality of individual solar cell elements arranged in an area that is essentially evenly distributed around a point of maximum intensity of a source of concentrated light adapted to impinge on said area;

means connecting said solar cell elements in at least one path between external electrodes, said path containing a number of said elements connected in series; and

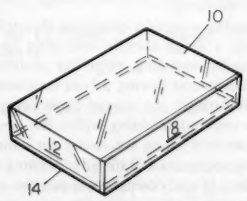
a light distribution member positioned between said source of concentrated light and said area containing said plurality of solar cells, said light distribution member containing a fluorescent material and further comprising optical coupling means interposed between said light distribution member and said solar cell elements, said optical coupling means comprising a refractive index matching material having a nonuniform refractive index such that said index is low at the center of said optical coupling means and increases with position away from said center, whereby localized regions of high intensity light from said source of concentrated light are converted to a uniform intensity light flux over said area.

4,329,535

SOLAR CELLS AND COLLECTOR STRUCTURES

Charles F. Rapp, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 3, 1978, Ser. No. 902,521
Int. Cl.[3] H01L *31/04*
U.S. Cl. 136—259 12 Claims



1. In a luminescent solar collector and concentrator comprising a radiation collection medium for receiving incident solar radiation, said medium containing at least one luminescent species capable of emitting luminescent radiation upon excitation with incident solar radiation, said medium being totally internally reflective of a major portion of said emitted luminescent radiation, a relatively small surface area of said medium being optically coupled to a photovoltaic solar cell responsive to said emitted luminescent radiation, the improvement wherein said radiation collection medium is a composite structure comprising a thin layer containing at least one luminescent species, said layer being optically coupled to a thick radiation conducting layer of at least 0.5 mm thickness, which thick layer (1) is totally internally reflective of a major portion of said emitted luminescent radiation, (2) has an index of refraction close to that of said thin layer, (3) is less absorptive of said emitted luminescent radiation than said thin layer and (4) has a thickness ratio to said thin luminescent layer of higher than 4:1.

4,329,536

OIL-IMPREGNATED POWER CABLE

Atushi Sato, Tokyo; Isoo Shimizu, Yokohama; Keizi Endo, Yokohama, and Hitoshi Yanagishita, Yokohama, all of Japan, assignors to Nippon Petrochemical Company, Ltd., Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 160,030
Claims priority, application Japan, Jun. 19, 1979, 54/763498
Int. Cl.[3] H01B *9/06*
U.S. Cl. 174—25 C 6 Claims

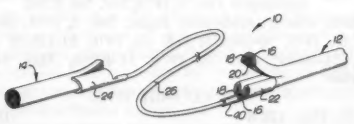
1. An oil-impregnated power cable comprising an insulation layer formed by winding a composite film onto an electric conductor and impregnated with an impregnating oil, said composite film comprising a laminate obtained by bonding at least one layer of the insulating paper by means of melt-adhesion or chemical bonding, said impregnating oil comprising distillates within a boiling range in terms of values at normal pressure between 265° C. and 360° C. which distillates contain sulfur compounds in the range of from 10 to 500 ppm and are obtained by contacting a hydrocarbon mixture which mixture results from a thermal cracking of petroleum hydrocarbons at a temperature of 700° C. or higher and which mixture contains principally components with a boiling range between 75° C. and 198° C. consisting essentially of monocyclic aromatics and further contains aromatic olefins of the boiling range just defined above, in liquid phase with an acid catalyst.

4,329,537

CRIMP-TYPE CABLE SHIELD BONDING DEVICE

Maurice G. Mangrobang, Culver City, and Charles W. Waas, Huntington Beach, both of Calif., assignors to Communications Technology Corporation, Los Angeles, Calif.

Filed Aug. 14, 1979, Ser. No. 66,780
Int. Cl.[3] H01R *4/18*
U.S. Cl. 174—84 C 3 Claims



1. In a crimp-type cable shield bonding device for electrical connection to the shield of a sheathed and shielded cable having an outer protective sheath and an underlying shield which enclose a bundle of conductors, the combination of:

a tubular clamp comprising a generally semi-cylindrical outer portion adapted to fit over the outer protective sheath at one end of the cable and a generally V-shaped inner portion within said outer portion, with its apex extending toward said outer portion, said inner portion being insertable between the shield and the conductors at said end of the cable with its apex extending toward the shield, with said outer and inner portions formed integrally with each other forming a sleeve for slidingly receiving a portion of the cable sheath and shield;

said inner portion of said tubular clamp having means for gripping the shield of the cable when said clamp is crimped onto the cable; and

means for securing an electrically conductive member to said tubular clamp.

4,329,538

CONDUCTOR BAR OF AN ELECTRIC MACHINE

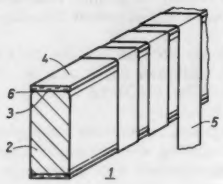
Hartmut Meyer, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 937,437, Aug. 28, 1978, abandoned. This application Mar. 28, 1980, Ser. No. 135,119

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 2740544

Int. Cl.[3] H01B 7/02

U.S. Cl. 174—119 R 9 Claims



1. A conductor bar of an electric machine comprising a single solid conductor of generally rectangular cross-section having four longitudinally-extending side-portions, at least one longitudinally-extending strip-shaped insert disposed adjacent the surface of at least one of the side portions of said conductor, an insulating sleeve wound directly over said strip and the three exposed longitudinally-extending side portions of said conductor to surround said conductor and said strip, said strip extending on said surface at an angle to the winding of said insulating sleeve and being disposed to form canals at the edges of the insert between the insert and the conductor which extend along the conductor at the inside of the insulating sleeve, and a hardenable impregnating material applied to the conductor, the strip and the insulating sleeve which enters and substantially fills the canals.

4,329,539

SUPERCONDUCTING COMPOUND STRANDED CABLE

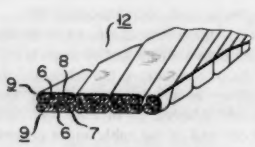
Yasuzo Tanaka, Yokohama, and Yoshio Furuto, Higashi, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 746,250, Dec. 1, 1976, abandoned. This application Feb. 1, 1979, Ser. No. 8,263

Claims priority, application Japan, Dec. 3, 1975, 50-142889; Dec. 18, 1975, 50-150976; Feb. 10, 1976, 51-13535; Apr. 10, 1976, 51-40601; Apr. 28, 1976, 51-49058; May 14, 1976, 51-54965

Int. Cl.[3] H01B 12/00

U.S. Cl. 174—128 S 15 Claims



1. A superconducting compound cable, comprising a plurality of strands, at least one of said strands containing at least one filament of a brittle superconducting compound material extending longitudinally along the strand, each of said strands having two cross sectional dimensions transverse to the direction of the strand and transverse to each other, said strands being arranged in layers and stranded at a predetermined pitch in the axial direction of the cable, the total cross sectional area of all the strands of the cable accounting for more than 50 percent of that of a quadrilateral circumscribed about the periphery of the cross section of the cable, the stranding pitch P of the cable being in the range of 2 to 20 times the width W of the cable, the ratio of the width of the cable to the thickness t_0 of the cable being in the range of 1 to 100, and the cable being constructed with the following relationship:

$$t_0 = 2R_0 \times \epsilon_0 \times (1 + rW^2/P^2)$$

where R_0 is the allowable bending radius of the cable which is a radius of curvature of the cable measured from the center of the curvature to a neutral interface of the cable, and ϵ_0 is the upper strain limit of the superconducting compound material within which the superconducting compound material does not degrade in superconducting characteristics.

4,329,540

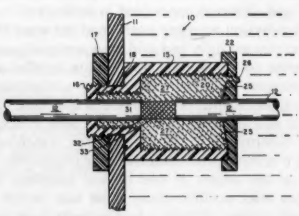
BLOCKING FEED-THROUGH FOR COAXIAL CABLE

Robert F. Howarth, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1980, Ser. No. 136,858

Int. Cl.[3] H01B 17/30; H02G 3/22

U.S. Cl. 174—153 R 2 Claims



1. The combination of a wall provided with an opening therethrough, a coaxial cable extending through the opening, and apparatus assuring secure watertight integrity of said coaxial cable where it passes through said opening in said wall;

said coaxial cable comprising a center conductor, a dielectric filler coaxially disposed about the conductor, a cable shielding coaxially disposed about the filler and an outer jacket coaxially disposed about the shielding, the coaxial cable having a portion of its outer jacket removed to expose its shielding;

a housing having a portion extending through said opening and having a longitudinally extending cavity provided with inwardly extending, ridge-like protuberances in the lateral surfaces and having a bore receiving said coaxial cable therethrough, the coaxial cable being positioned to locate the exposed shielding within the cavity;

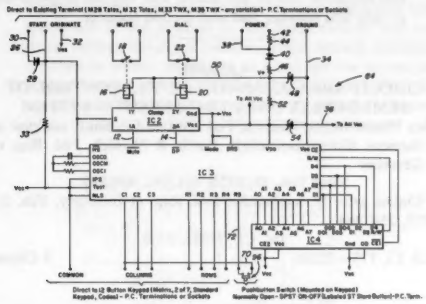
means substantially filling the cavity for adhesively engaging the protuberances and surfaces defining the cavity, the outer surface of said coaxial cable and the exposed shielding and having a plastic property prior to curing, and a rigid hardened property after curing, the adhesively engaging means holding and securing the coaxial cable without exerting compressive stresses; and

a cap on said housing, said cap being provided with a port to allow the escape of excess adhesively engaging means and any gas bubbles, a bore aligned with the housing bore and receiving said coaxial cable therethrough and further provided with a projection extending into said cavity to assure the displacement of the adhesively engaging means while plastic, to rid it of voids and to cause the adhesively engaging means to completely fill the cavity, thereby assuring secure watertight electrical integrity by the adhering engagement of the shielding with the adhesively engaging means and preventing hosing.

4,329,541
DIALING SYSTEM FOR TELEPRINTER

Robert F. Gerber, Jr., Box 4E, Star Rte., Jim Thorpe, Pa. 18229

Filed May 14, 1980, Ser. No. 150,675
Int. Cl.[3] H04M *1/42;* H04L *15/00*
U.S. Cl. 178—3 15 Claims

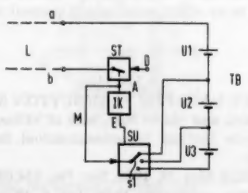


1. In a conventional teleprinter terminal provided with a 12 button keypad including numerals 0 through 9, * and # symbols; and having a start button; a relatively high voltage power supply; a ground line; a mute circuit; and a dial circuit, the improvement comprising: a solid state dialing system operated by the keypad including integrated circuit means for receiving inputs from said 12 button keypad, storing the inputs and outputting pulses in response to the stored inputs; command signal input means connected to said integrated circuit means from said start button for initiating operation thereof in response to a command signal; and bias voltage means connected to said high voltage power supply and said ground line for producing a plurality of discrete relatively lower voltage levels to power said integrated circuit means and the command signal input means.

4,329,542
CIRCUIT ARRANGEMENT FOR AN ELECTRONIC D.C. TELEGRAPH TRANSMITTER

Alfred Wild, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 3, 1980, Ser. No. 156,205
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925747
Int. Cl.[3] H04L *25/02;* H04M *3/00*
U.S. Cl. 178—69 R 4 Claims



1. A circuit arrangement for an electronic d.c. telegraph transmitter, comprising:

first and second terminals for connection to a transmission line;

a telegraph battery including a first pole connected to said first terminal, a second pole and a plurality of intermediate taps providing different voltages;

a keying circuit including a control input for receiving keying signals, an output connected to said second terminal, and an input for receiving a voltage to be placed on the transmission line;

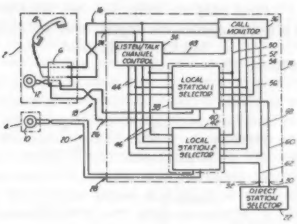
a current regulator including an input for connection to said battery, an output connected to said input of said keying circuit, and operating to maintain a constant current to the transmission line; and

switch means including a plurality of inputs connected to respective taps of said telegraph battery, an output connected to said input of said current regulator, a control input connected to said output of said current regulator, and threshold means connected to said control input and responsive to the voltage at said output of said current regulator to cause said switch means to switch through and directly connect a corresponding tap voltage.

4,329,543
COMMUNICATION SYSTEM

Glenn S. Danford, Oklahoma City, Okla., assignor to Southwest Utilities, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 73,075, Sep. 6, 1979. This application Nov. 19, 1979, Ser. No. 95,449
Int. Cl.[3] H04M *9/08*
U.S. Cl. 179—1 HF 15 Claims



1. A system for combining telephone service with hands-free talk-back intercommunication service, said system comprising:

a hands-free talk-back intercommunication network including:

a main distribution station having a talk channel and a listen channel;

a plurality of local stations associated with said main distribution station, at least a first one of said local stations having a first telephone located thereat and at least a second one of said local stations having a first transducer means located thereat and said second local station also having means for connecting the first transducer means in balanced electrical connection with said main distribution station; and

a telephone exchange network connected to said first telephone located at said first local station and also connected to said main distribution station;

means connected to said telephone exchange network for monitoring when said first telephone initiates a call to said second local station;

means, responsive to said monitoring means detecting the initiation of a call to said second local station, for selecting said first transducer means and for placing said called first transducer means in communication with said talk channel and listen channel;

means for providing an electrical interface between said talk channel and said listen channel and said telephone exchange network;

means associated with said interface means for balancing said interface;

first talk amplifier means connected to said interface means;

first means for setting a first level of loudness and second means for setting a second level of loudness wherein each of said first and second means is responsive to a first signal from said call monitoring means for selectable connection to said first talk amplifier means;

second talk amplifier means connected to said first and second level setting means for providing an output from said talk channel;

means connected to said second talk amplifier for switchably connecting said first transducer means to a respective one of said output from said talk channel and an input to said listen channel;

means connected to said switchable connecting means for providing said input to said listen channel and for activating an electrical signal for testing said balancing means;

means connected to said test activating means and to said interface means for automatically controlling the gain of said listen channel; and

means connected to said interface means, said test activating means and said switchable connecting means for automatically controlling the switching by said switchable connecting means of said first transducer means to a respective one of said output of said talk channel and said input of said listen channel.

4,329,544

SOUND REPRODUCTION SYSTEM FOR MOTOR VEHICLE

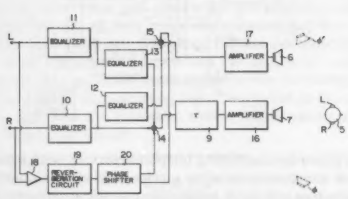
Akitoshi Yamada, Daito, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 16, 1980, Ser. No. 150,659

Claims priority, application Japan, May 18, 1979, 54-61847

Int. Cl.³ H04R *5/04*

U.S. Cl. 179—1 VE **4 Claims**



1. A sound reproduction system for a motor vehicle which extends the sound field within a passenger compartment comprising:

a signal source for generating an input signal;

first and second loud-speakers spaced laterally from each other and disposed in the passenger compartment;

a transfer function converting circuit connected between said signal source and said first and second loudspeakers, said transfer function converting circuit including a first equalizer connected in common with both reproduction channels of said first and second loudspeakers and including a second equalizer connected to either one of the reproduction channels of said first and second loudspeakers, said first and second equalizers converting the transfer functions between both ears of a listener in the passenger compartment and said first and second speakers into different transfer functions between said listener and an imaginary third speaker located at a position at different directions from said first and second speakers such that sound pressures applied to both ears of said listener from said imaginary third speaker are equal to sound pressures applied to both ears of said listener from said first and second speakers;

a delay circuit connected between said transfer function converting circuit and said first and second speakers so that said delay circuit is inserted in one of two reproduction channels respectively leading to said first and second speakers, said delay circuit compensating for the difference between the distance from said first speaker to said listener and the distance from said second speaker to said listener; and

a reverberation circuit for providing reverberation to the input signal from said signal source, said reverberation circuit being connected between said signal source and two output terminals of said transfer function converting circuit for respective reproduction channels for said first and second speakers so that the respective outputs of said transfer function converting circuit and the output of said reverberation circuit are added and applied respectively to said first speaker and said second speaker.

4,329,545

CIRCUIT ARRANGEMENT FOR THE CONTROL OF SEMI-DUPLEX DATA TRANSMISSION SYSTEM

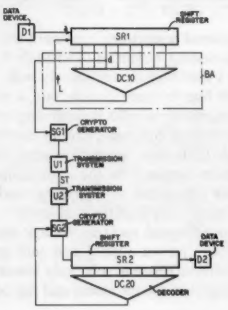
Jörg Westermayer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 19, 1976, Ser. No. 659,969

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1975, 2507804

Int. Cl.³ H04L *9/00*

U.S. Cl. 178—22.03 **3 Claims**



1. A circuit arrangement for controlling semiduplex crypto data transmission in a data transmission system which includes a data source, a transmitter crypto device, a transmission path, a receiving crypto device and a data terminal, said circuit arrangement comprising:

a shift register interposed between said data source and said transmitter crypto device to receive data serially, said shift register including a data input connected to the data source, a reset input, a data output connected to the transmitter crypto device, and a plurality of parallel outputs including said data output; and

an order evaluator connected to said plurality of outputs and to said reset input and operable to emit an reset signal in response to an order word which is equal to a stop order block.

4,329,546

INTERFACE UNIT FOR PUSHBUTTON SELECTOR

Vittorio Montesi, and Mario Besi, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed May 28, 1980, Ser. No. 154,091

Claims priority, application Italy, Jun. 5, 1979, 23279 A/79

Int. Cl.³ H04M *1/44*

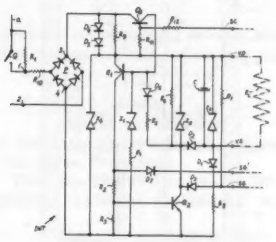
U.S. Cl. 179—81 R **15 Claims**

1. In a telecommunication system wherein a hook switch in parallel with a high-ohmic shunt resistor is inserted in a line loop in series with a generator of dial pulses including a push-button selector and a signal coverter provided with digit-storing means,

the combination therewith of an interface unit interposed between said hook switch and said generator, said interface unit comprising:

a rectifier bridge having an input diagonal and an output diagonal, said input diagonal being inserted in a conductor of said line loop in series with the parallel combination of said shunt resistor and said hook switch;

an impedance network connected across said output diagonal, said network being provided with two supply leads for delivering operating voltage to said generator irrespectively of the position of said hook switch, said network further having a resistive shunt branch including switchover means responsive to a voltage rise across said input diagonal due to closure of said hook switch for significantly lowering the resistance of said shunt branch with resulting reduction in said operating voltage;



an outgoing conductor extending from said shunt branch to said generator for signaling the closure of said hook switch; and

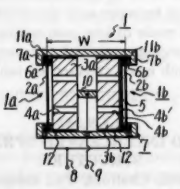
an incoming conductor extending from said generator to said network for carrying dial pulses generated upon manipulation of said pushbutton selector, said network further including pulse-receiving means connected to said incoming conductor for reversing said switchover means in the closed position of said hook switch to raise the resistance of said shunt branch to a value high enough to approach an open-circuit condition of said line loop.

4,329,547

DUAL SECTION ELECTRET MICROPHONE

Tsutomu Imai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 3, 1980, Ser. No. 126,380
Claims priority, application Japan, Mar. 8, 1979, 54-27109
Int. Cl.³ H04R *19/04*
U.S. Cl. 179—111 E **7 Claims**



1. A capacitor microphone comprising

a first transducer section including a conductive back plate portion and a diaphragm, the latter being formed, at least partially, of a first electret;

a second transducer section including a conductive diaphragm and a back plate portion, the latter being formed, at least partially, of a second electret;

a first lead connected to the diaphragms of said first and second transducer sections; and

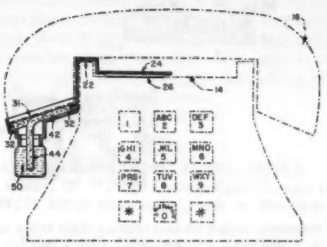
a second lead connected to the back plate portions of said first and second transducer sections, so that an output signal appears between said first and second leads.

4,329,548

TELEPHONE STERILIZER APPARATUS

Jack W. Strassburg, 605 Park Ave., New York, N.Y. 10021

Filed Jun. 4, 1980, Ser. No. 156,381
Int. Cl.³ H04M *1/17*; H04R *1/12*
U.S. Cl. 179—185 **7 Claims**



1. A telephone sterilizer apparatus adapted for use in conjunction with a telephone having a handset and a cradle for removably retaining said handset when said telephone is not in use, said handset having a mouthpiece portion for use in speaking into said telephone when said handset is removed from said cradle, said sterilizer apparatus comprising mounting means adapted for supportably mounting said apparatus on said cradle; a receptacle for seating said mouthpiece portion therein when said apparatus is mounted on said cradle, said receptacle having an upstanding surrounding perimetral wall portion for receivably surrounding said seated mouthpiece portion; an absorbent pad seated in said receptacle below the upper extent of said perimetral wall portion, said pad being capable of saturation by a disinfectant liquid; a connector portion in flow-through communication with said receptacle; a passageway between said connector portion and said receptacle; and a liquid disinfectant container having a neck portion extending from said connector portion in flow-through communication with said passageway for enabling said pad to be saturated by said containerized liquid disinfectant, said pad being seated in said receptacle with a portion thereon in capillary communication with said liquid disinfectant through said passageway for drawing liquid disinfectant from said mounted container to said pad through said passageway due to capillarity for substantially replenishing said liquid disinfectant in said pad for maintaining the saturation of said pad.

4,329,549

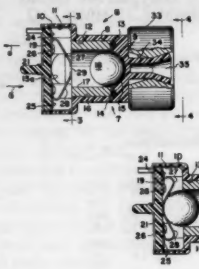
MAGNETICALLY BIASED VELOCITY CHANGE SENSOR

David S. Breed, Boonton, N.J., assignor to Breed Corporation, Fairfield, N.J.

Filed Apr. 29, 1980, Ser. No. 144,835
Int. Cl.³ H01H *35/14*
U.S. Cl. 200—61.45 M **23 Claims**

1. In a sensor construction adapted for mounting on a vehicle or the like having an instrumentality to be operated in response to acceleration of said vehicle above a predetermined threshold, said sensor having a body provided with a tubular passage containing a fluid, a magnetically permeable sensing mass within said passage movable in response to acceleration of said vehicle from an initial position toward a second position in which said sensing mass initiates operation of said instrumentality, there being a clearance between said passage and said sensing mass of such size as to enable said fluid to damp movement of said sensing mass, the improvement comprising magnetic means exerting a predetermined magnetic bias force on said sensing mass and restraining movement of the latter from said initial position until said bias force is overcome by acceleration whereupon said sensing mass is movable relatively to said body toward said second position, said magnetic means being of such capacity as to continue to exert on said sensing mass a

magnetic force of decreasing magnitude as said sensing mass moves toward its second position, the magnetic force exerted



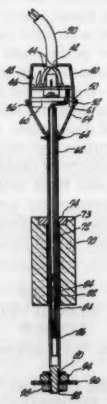
by said magnetic means on said sensing mass being sufficient to return the latter to said initial position from any other position short of said second position.

4,329,550

DELAYED ACTION LIQUID LEVEL SENSING APPARATUS

Donald Verley, Valencia, Calif., assignor to McCann's Engineering & Manufacturing Company, Los Angeles, Calif.

Filed May 12, 1980, Ser. No. 149,265
Int. Cl.³ H01H *35/18*
U.S. Cl. 200—84 C **7 Claims**



1. In a liquid level float controlled switch apparatus having a housing within which electrical components are present in a fluid-tight medium, and a probe section integral with and suspended from said housing; the improvements comprising, in combination:

a float means disposed about said probe section for traversing said probe section in a vertical plane,

a first magnet integral with said float means,

a magnetically operated switch means located within said probe section and having oppositely facing magnetic elements adapted to contact one another in response to the presence of a magnetic field occasioned by the position of said first magnet relative to said magnetic elements,

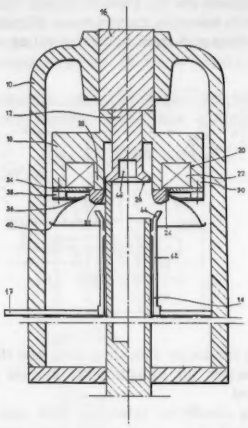
a second magnet disposed in a vertical plane and spaced apart on the same axis from said magnetic switch means, said second magnet slidably engaged with the exterior of said probe section.

4,329,551

ALTERNATING CURRENT INTERRUPTER WITH MAGNETIC ARC EXTINGUISHING MEANS

Georges Bernard, Saint-Egreve, and Pierre Leclercq, Moirans, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Nov. 5, 1979, Ser. No. 91,365
Claims priority, application France, Nov. 10, 1978, 78 32206
Int. Cl.³ H01H *33/18*
U.S. Cl. 200—147 R **18 Claims**



1. An alternating current interrupter having a magnetic blow-out arc extinguishing device comprising:

a sealed housing made of insulating material and filled with a dielectric gas,

a pair of separable contacts,

a first ring-shaped electrode associated to one of said contacts, so that the arc drawn between the separated contacts is transferred to said first electrode,

an annular coil disposed coaxially with said first electrode so as to produce a magnetic field extending in the arcing zone between the open contacts which causes the arc to rotate rapidly along said first electrode,

said first electrode including a ring of predetermined thickness in the axial direction made of good conductive material which is secured to the inner edge on the arcing zone side of the front face of said coil so as to cover only a small portion of said front face to reduce the electrodynamic repulsion forces between said electrode and coil, and

a metallic shield made of low conductive material disposed between the arcing zone and the outer portion of said front face which is not covered by said first electrode.

4,329,552

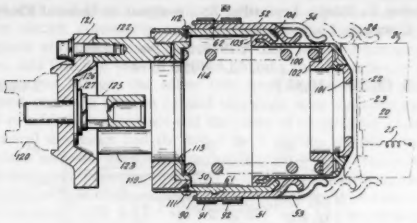
WIRE FORMED INTERLEAVED SPRING CONTACT STRUCTURE

Lorne D. McConnell, Chalfont, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 23, 1980, Ser. No. 143,038
Int. Cl.³ H01H *33/14*
U.S. Cl. 200—147 R **11 Claims**

1. A contact assembly comprising a first contact comprising a plurality of parallel spring wire members fixed in a tubular cluster around a support body; said plurality of spring wire members consisting of a first plurality of members all terminating in a first plane and a second plurality of members terminating in a second plane axially spaced from said first plane; each of said plurality of members having an inwardly reentrant bend at their ends to define first and second internal contact ring regions which are axially spaced from one another and which have given diameters; and a second contact which is coaxial

with said first contact and which is adapted to engage said first contact by moving telescopically into the interior of said first



contact; said second contact having an outer diameter larger than said given diameters of said contact ring regions.

4,329,553

GAS-BLAST SWITCH

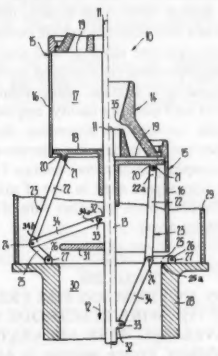
Rudolf Graf, Oberentfelden, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed Aug. 27, 1979, Ser. No. 70,245

Claims priority, application Switzerland, Sep. 6, 1978, 9356/78

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—148 A **6 Claims**



1. A gas-blast switch comprising:

means providing a pump cylinder having a pump chamber containing an extinguishing gas;

a pump piston arranged for movement within said pump cylinder;

a blast nozzle supplied with extinguishing gas by said pump cylinder;

a movable contact element;

said pump cylinder being conjointly movable together with said contact element and surrounding said pump chamber;

said pump piston being selectively movable between respective positions defining a cutoff stroke and a cuton stroke;

said pump piston, during the course of its cutoff stroke, expelling the extinguishing gas out of said pump chamber through said blast nozzle;

toggle lever means containing a first toggle element and a second toggle element;

said toggle lever means being movable between a bent position and an extended position;

means for hingedly connecting said first toggle element at the pump piston;

means for stationarily hingedly connecting said second toggle element;

said toggle lever means assuming said bent position in said cuton position;

a guide element;

means for operatively coupling said guide element with said movable contact element;

said toggle lever means being guided by said guide element; and

said guide element, during the course of said cutoff stroke of the pump piston, initially intensifying the bent position of the toggle lever means which prevails in said cuton position, thereafter diminishing such bent position of said toggle lever means and finally again intensifying said bent position of said toggle lever means.

4,329,554

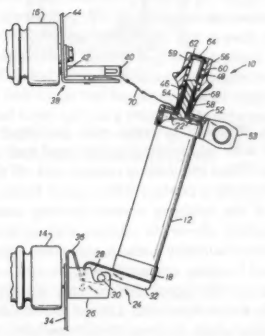
LOADBREAK ARC SNUFFING DEVICE

William J. Huber, 535 W27560 Country Club Ct., and Todd K. Knapp, W270 53935 Heather Dr., both of Waukesha, Wis. 53186

Filed Jan. 7, 1980, Ser. No. 110,350

Int. Cl.³ H01H *33/06, 9/32*

U.S. Cl. 200—151 **10 Claims**



1. An arc snuffing device for quenching the arc produced on load break from a fixed contact, said device comprising

a dielectric rod,

an electrically conductive contact located on the rod, said contact being engageable with said fixed contact,

a tube formed from an arc quenching material mounted on said rod for axial movement on said rod from a position enclosing said contact to a position exposing said contact,

means for biasing said tube to said enclosing contact position,

said tube being moved to the open position relative to said contact on movement of said tube into engagement with the fixed contact,

whereby said tube will move to the contact enclosing position when said contact is disengaged from said fixed contact to extinguish the arc produced on load break.

4,329,555

TRIGGER OPERATED TOOL HANDLE SWITCH

Julius P. Wied, Hudson, Ohio, assignor to Lucerne Products, Inc., Hudson, Ohio

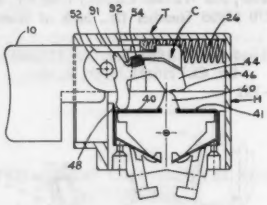
Continuation-in-part of Ser. No. 963,778, Nov. 27, 1978, Pat. No. 4,256,942. This application Feb. 4, 1980, Ser. No. 117,866

Int. Cl.³ H01H *13/08*

U.S. Cl. 200—157 **3 Claims**

1. An electric switch mechanism for portable electric motor-drive type tools comprising, an insulator switch housing, at least a pair of stationary electrical contacts disposed in said switch housing in spaced relation to each other and with their contact making faces substantially coplanar, a reciprocable

contact carrier disposed in the housing for linear reciprocation therein relative to said stationary contacts, a movable electrically conductive bridging contact carried by said contact carrier and having opposite contacting ends forming respectively a leading contact end and a trailing contact end spaced at approximately the same spacing as said stationary contacts for sliding movement between a non-bridging position where said bridging contact is out of engagement with at least one of said stationary contacts and a bridging position where the bridging contact is in engagement with at least two of said stationary contacts in electrically conducting relation therewith, pivot type hinge means hingedly securing said bridging contact at a point adjacent its trailing contact end to said contact carrier, bias means on the contact carrier using the movable bridging contact towards the stationary contacts, and



a projection disposed between said stationary contacts for engagement with said leading contact end and configured for pivoting and lifting the leading contact end off of the adjacent respective stationary contact with a quick break action during movement of the bridging contact leading contact end to a level substantially above the contact making face of the adjacent respective stationary contact, said pivot type hinge means including said bridging contact having an upwardly extending stem disposed at the top of the bridging contact at its trailing contact end, and said contact carrier has a pair of coacting spaced protuberances disposed in substantially the same horizontal plane and extending transversely from the contact carrier and straddling and contacting the bridging contact stem at a point on the stem spaced substantially from the top of the stem to hingedly secure the bridging contact to the contact carrier.

4,329,556

N-AZIDOSULFONYLARYL-MALEINIMIDES

Roland Rubner, Röttenbach; Eberhard Kühn, Hemhofen, and Hellmut Ahne, Röttenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

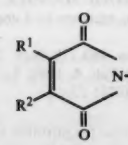
Filed May 9, 1980, Ser. No. 148,142

Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919823

Int. Cl.³ C07D *207/452, 207/456*

U.S. Cl. 548—549 **2 Claims**

1. N-azidosulfonylaryl-maleinimides of the formula



where R = phenyl or naphthyl; and R^1 and R^2 are H, CH_3 or Cl and may be the same or different, with the provision that R^1 and R^2 are not, at the same time, CH_3 and Cl.

4,329,557

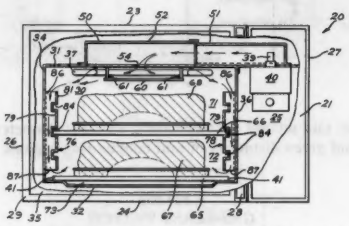
MICROWAVE OVEN WITH IMPROVED ENERGY DISTRIBUTION

James E. Staats, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 7, 1979, Ser. No. 101,342

Int. Cl.³ H05B *6/74*

U.S. Cl. 219—10.55 F **9 Claims**



1. A microwave cooking appliance comprising a cooking cavity for receiving objects to be heated, including a top wall, a bottom wall, a pair of side walls, and a front wall defined by a front opening access door, a source of microwave energy located externally of said cooking cavity, a microwave feed passage formed externally of said cooking cavity for introducing microwave energy from said source into said cooking cavity, a support self for defining separate cooking areas in said cooking cavity on opposite sides of said shelf, and a pair of rectangular waveguides entirely confined within said cooking cavity and arranged in a vertical plane supported from opposed side walls of said cooking cavity, opposed ends of each of said rectangular waveguides extending above and below said shelf, said waveguides each being operative independently of said shelf for coupling microwave energy from a first level spaced from one side of said shelf in one of said cooking areas to a second level spaced from the other side of said shelf in the other of said cooking areas.

4,329,558

APPARATUS AND PROCESS FOR PREVENTING RUPTURE OF THE WIRE ELECTRODE OF AN EDM TRAVELLING WIRE APPARATUS

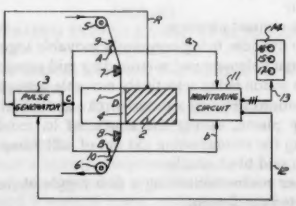
Roland Martin, Valleiry, France, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed Jul. 23, 1980, Ser. No. 171,456

Claims priority, application Switzerland, Jul. 24, 1979, 6852/79

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 W **6 Claims**



1. In an apparatus for EDM machining an electrode workpiece by an electrode tool in the form of a travelling wire in a machining zone between a supported length of said travelling wire and a surface of said workpiece, said apparatus comprising a voltage pulse generator having an output terminal con-

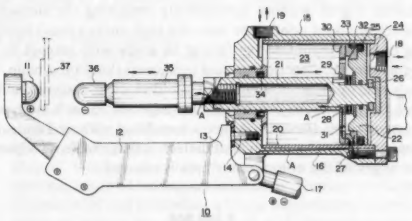
nected to said workpiece and another output terminal connected to said wire by two separate circuits, one of said circuits connecting said output terminal to a sliding contact in engagement with said wire on one side of said machining zone and the other circuit connecting said terminal to a sliding contact engaged with said wire on the other side of said machining zone, said first and second circuits forming two branches of a Wheatstone bridge, the other two branches of which are formed one by a portion of said electrode wire between the first of said sliding contact and the point of occurrence of an electrical discharge and the other by a portion of said wire between said second contact and said point of occurrence of said electrical discharge, the improvement comprising means for measuring the unbalance of said bridge during each electrical discharge, and means controlled by said last mentioned means for adjusting at least one machining parameter such as to cause continuous unbalance of said bridge from one of said electrical discharges to the next, wherein said means for measuring the unbalance of said bridge comprises comparator means connected across a diagonal of said bridge for providing an output signal having an amplitude proportional to the unbalance of said bridge for each of said electrical discharges, means for storing the amplitude of said signals, means for comparing consecutive stored amplitudes and means for controlling said adjusting means when a difference in said amplitudes less than a reference value is detected.

4,329,559

RESISTANCE WELDER

Tomomi Kishi, and Yoshitaka Yamamoto, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 3, 1980, Ser. No. 165,945
Claims priority, application Japan, Jul. 5, 1979, 54-084431
Int. Cl.³ B23K *11/10*; H01R *41/00*
U.S. Cl. 219—89 **4 Claims**



1. A resistance welder comprising a pressurizing cylinder, a first electrode attached to the end of a rod inside said pressurizing cylinder and a second electrode attached to an arm secured to said pressurizing cylinder, characterized in that said pressurizing cylinder also serves as an electric power feeding cylinder, said pressurizing cylinder slidably receiving a piston provided with a collector plate electrically connected to said rod attached to said first electrode, said collector plate being electrically contacted by a collector ring which is adapted to radially expand to make selective electrical contact with the inner surface of said cylinder, and a spring interposed between said piston and said collector plate.

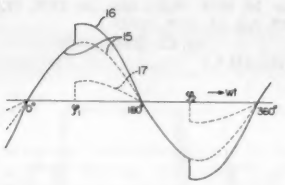
4,329,560

FLASH WELDING METHOD

Kinji Tanuma, Kawasaki, Japan, assignor to National Research Institute for Metals, Tokyo, Japan

Filed Apr. 7, 1980, Ser. No. 137,639
Claims priority, application Japan, May 29, 1979, 54-65654
Int. Cl.³ B23K *11/04, 11/24*
U.S. Cl. 219—100 **11 Claims**

1. In a method for flash welding metallic materials comprising a flashing step of applying a commercial alternating voltage or a direct-current voltage resulting from its full-wave recitification to the abutting ends of metal workpieces contacted partly with each other to generate Joule heat at their abutting ends and the vicinity thereof and then to generate sparks between said ends and repeating the aforesaid procedure, and an upsetting step of pressbonding said ends and supplying an electric current to the metallic workpieces during this time; the improvement comprising modulating said alternating voltage of direct-current voltage which is used as a



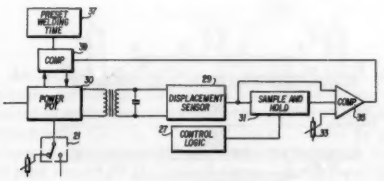
fundamental wave voltage by superimposing thereon another voltage to obtain a distorted wave voltage having an increased peak value for generating sparks between the abutting ends, said distorted wave voltage being such that in each 360° cycle the Joule heat generating period begins at a phase angle between −45° and 0° and terminates at a phase angle between 45° and 135° in first half cycle and begins at a phase angle between 135° and 180° and terminates at a phase angle between 225° and 315° in second half cycle, with spark generation beginning at the end of each Joule heat generating period.

4,329,561

METHOD OF ENSURING THE MAINTENANCE OF CONSTANT QUALITY OF SPOT WELDS

Rolf Schafer, and Sumanjit Singh, both of Aachen, Fed. Rep. of Germany, assignors to Friedrich Eichhorn, Aachen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 748,605, Dec. 8, 1976, abandoned. This application Feb. 14, 1979, Ser. No. 11,975
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555792
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—110 **8 Claims**



1. A method of improving the reproducibility of the welds produced by an electric spot welding machine, which comprises

(a) passing a preheating current of lower magnitude than a subsequent welding current through the workpieces to be welded;

(b) monitoring the resistance of the weld starting with the first cycle of preheating current;

(c) determining when the rate of decrease of the total weld resistance has fallen below a predetermined limit; and

(d) then switching over from said preheating current to said welding current.

4,329,562

METHOD AND DEVICE FOR IMPROVING THE PROPERTIES OF THIN STEEL PLATES

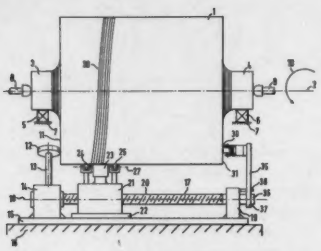
Jean Crahay, Francorchamps; Christian Marique, Liege; Henri Bonnarens, Esneux; Rene DeFraye, Liege, and Adolphe Bragard, Esneux, all of Belgium, assignors to Centre de Recherches Metallurgiques-Centrum voor Research in Metallurgie, Brussels, Belgium

Filed Sep. 20, 1978, Ser. No. 943,779

Claims priority, application Luxembourg, Sep. 22, 1977, 78167; Mar. 16, 1978, 79251; Mar. 16, 1978, 79252; Mar. 28, 1978, 79317; Jun. 12, 1978, 79797

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LJ 18 Claims



1. A method of marking a rolling-mill roll for use in improving the properties of thin steel plates, in which the final morphology of the steel plate surface is determined by contact with the rolling-mill roll, said method being characterized by the step of forming on a surface of said rolling-mill roll by destroying material on the surface of said roll a design constituted by at least one motif which is reproduced at predetermined intervals without discontinuity, the nominal dimensions of said motif lying between 2 and 15 microns in height and between 30 and 250 microns in plan.

4,329,563

GLOW DISCHARGE HEATING APPARATUS

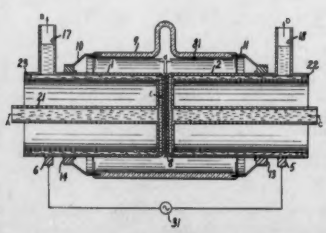
Hirotsugu Komura; Shigeo Ueguri, and Youichiro Tabata, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 26, 1979, Ser. No. 6,780

Claims priority, application Japan, Feb. 7, 1978, 53/13090

Int. Cl.³ H05B 7/16

U.S. Cl. 219—121 P 40 Claims



1. A glow discharge heating apparatus comprising at least one pair of discharge electrodes disposed in opposite relationship to form a predetermined gap therebetween, means for applying a voltage across said discharge electrodes to cause a glow discharge therebetween, said glow discharge supplying thermal energy to the discharge electrode acting as a cathode during said glow discharge, and a liquid to be heated flowing through said discharge electrode acting as said cathode to be heated with said thermal energy wherein an area with which said discharge electrodes are opposite to each other is smaller than an area of a portion of one of said discharge electrodes having caused thereon said glow discharge thereby to impart a positive resistance characteristic to the current-to-voltage characteristic of said glow discharge.

4,329,564

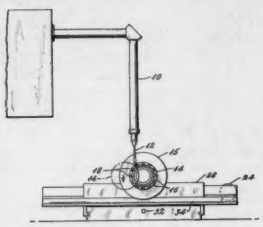
LASER UNDERCUTTING METHOD

Robert C. Hazelton, Christiansburg, and J. Ray Hoyt, Radford, both of Va., assignors to Kollmorgen Technologies Corp., Dallas, Tex.

Filed Oct. 28, 1980, Ser. No. 198,925

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LJ 8 Claims



1. A method for removing insulating dielectric material situated between the conductor bars of an electric commutator assembly so that the surface of said dielectric material is depressed with respect to the surface of the conductor bars, thus forming a recess between adjacent conductor bars of predetermined depth, comprising sequentially exposing the surface of the dielectric material between conductor bars to at least one high energy beam of a frequency and energy level suitable to and for a time sufficient to remove said dielectric material to a desired degree without substantially impairing the surface of the commutator conductor bars, the high energy beam impinging on the commutator surface at an angle with respect to the perpendicular direction on said surface so that in the main, the high energy beam impinges on the dielectric material and at least the part of the conductor bars adjacent to each interspace between two adjacent conductor bars filled with said dielectric material, whereby removal of dielectric material from adjacent the edges of the commutator bars is assured.

4,329,565

IMAGE FIXING DEVICE

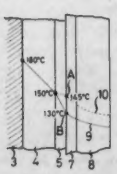
Ryoichi Namiki, Yokohama, and Yuichiro Higashi, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Sep. 19, 1980, Ser. No. 188,944

Claims priority, application Japan, Sep. 28, 1979, 54-124874

Int. Cl.³ H05B 1/00

U.S. Cl. 219—216 6 Claims



1. An improved image fixing device for a copying apparatus of the type having a fixing roll, the fixing roll including a metallic core, a resilient material layer superposed over the metallic core and an offset preventing layer superposed over the resilient material layer and a heating member disposed in

the fixing roll for heating the metallic core; and a pressing roll juxtaposed against the fixing roller and operative to apply pressure to a copy sheet having a toner image formed thereon allowed to pass between the two rolls, so that the toner image formed on the copy sheet can be fixed by melt adhesion by being pressed between the two rolls while being heated;

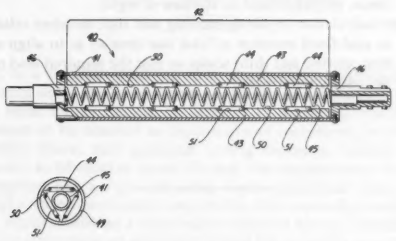
the improvement wherein the offset preventing layer has a higher heat intake than the toner image formed on the copy sheet, and the offset preventing layer being formed of a synthetic resinous material resistant to heat and having a good parting property, wherein the offset preventing layer being formed of a synthetic resinous material having from about 1% to about 5% by weight of metal powder.

4,329,566

HEATED FUSER ROLL

Clinton E. Hooper, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 12, 1980, Ser. No. 215,993
Int. Cl.³ H05B *3/00*
U.S. Cl. 219—216 **5 Claims**



1. In a heated fuser roll for use in a fuser apparatus for fixing toner images to a support surface, wherein said fuser roll includes:

a circular sleeve member;

at least one heating unit positioned within said sleeve member, each unit including (i) a plurality of axially disposed thermally conductive members each formed of a chordal section having a curved surface positioned in contiguous relation to the inside curved surface of said sleeve member and a substantially flat surface, (ii) a plurality of wafer shaped heating elements formed of a semiconducting ceramic material having a positive temperature coefficient of resistivity and exhibiting a Curie temperature transition point at which the resistance of said material increases with increasing temperature, and (iii) resilient means; and an electrical insulating member separating each of said heating units, the improvement wherein said flat surface of each of the conductive members include a plurality of cavities, each of said heating elements being positioned in one of the cavities.

4,329,567

ELECTRICALLY HEATED ROTATABLE CURLER BRUSH

Raymond W. Kunz, Monroe, and Eugene T. Fleischhauer, Stamford, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Aug. 27, 1979, Ser. No. 70,071
Int. Cl.³ H05B *3/40*; A45D *2/36*; A46B *7/10*
U.S. Cl. 219—222 **2 Claims**

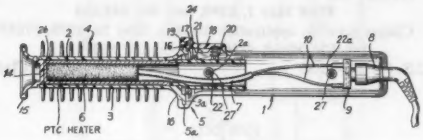
1. A heated lockable rotatable curling brush for styling and curling hair comprising:

a rod housing serving as a handle;

an elongated cylindrical inner tube made substantially of aluminum fixedly attached to said rod housing, protruding therefrom; and adapted to rotatably support an outer tube;

an outer tube of heat conducting plastic supporting a round brush, rotatably supported on said inner tube and in heat conductive contact therewith, wherein said inner tube is in heat conducting contact with substantially the whole length of said outer tube;

an elongated resistance heater in said inner tube in heat conduction relationship therewith, and with the axial center of the heater positioned forward of the longitudinal center of said inner tube at a point which offsets the unequal heat loss rate to the atmosphere of the forward and rearward ends of the outer tube to thereby provide substantially uniform heating of the outer tube and brush; an electric cord in the inner tube connected to the heater and an outside power source; and



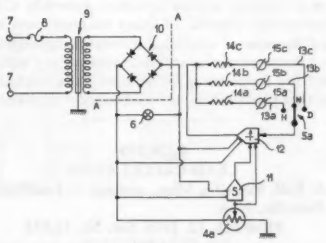
a selectively engageable spring latch coupling mechanism between the handle and outer tube at the front of the rod housing for locking the outer tube and rotatably releasing the outer tube.

4,329,568

APPARATUS FOR HEAT TREATMENT, PARTICULARLY THE ASEPTICIZATION, OF CONTACT LENSES

Pierre M. Rocher, 36, rue de Picpus, 75012 Paris, and Jacques B. Robin, 5, Allée de Flandre, 03200 Vichy, both of France

Filed Nov. 6, 1979, Ser. No. 91,830
Claims priority, application France, Nov. 9, 1978, 78 3149
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—497 **5 Claims**



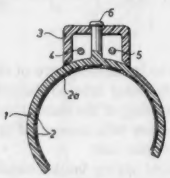
1. An apparatus for the heat treatment of contact lenses, selectively permitting either the heating of the lenses while subjected to an anti deposit treatment for the removal of deposits which settle thereon, at 30 to 40 degrees Celsius for about one hour or the heating of the lenses at 56–58 degrees Celsius for at least 3 hours for ascepticizing lenses contaminated by the normal bacterial flora of the eye of the type comprising a box having a housing adapted to receive a case for contact lenses and including an electrical circuit comprising a power supply and at least two heating units each comprising one heating resistor and a heat-sensitive switch device for controlling the heat gener-ated by said heating resistor within, respectively, the 30° to 40° C. and 56° to 58° C. temperatures characterized in that it comprises an electronic voltage threshold detection for interrupting current flow to said respective heating resistor and a programmed control device for controlling said threshold detection to supply current to said respective heating resistor for about one hour at said 30 to 40 degrees Celsius and for at least 3 hours at said 56 to 58 degrees Celsius, said pro-

grammed control device including switch means which selectively supplies current to the selected heating unit.

4,329,569
RESILIENT SNAP-ON ELECTRIC HEATING JACKET FOR TUBULAR OBJECTS

Bengt Hjortsberg, and Tommy Fredriksson, both of Hallstahammar, Sweden, assignors to Bulten-Kanthal AB, Hallstahammar, Sweden

Filed May 1, 1980, Ser. No. 145,634
Claims priority, application Sweden, May 16, 1979, 7904310
Int. Cl.[3] H05B *3/36*; F16L *53/00*; F03B *7/12*
U.S. Cl. 219—535 **3 Claims**



1. An electrical element including a curved surface portion, comprising

(a) a thin sheet of flexible plastic material constituting the radially internal surface layer of said curved surface portion;

(b) a pattern of electrically conductive spaced foil loops formed on the radially external surface of said thin plastic sheet, so as to define an electrical heating element; and

(c) a thick resilient support member of polymeric material at least coextensive with and overlying the radially external surface of said thin plastic sheet and said foil loops;

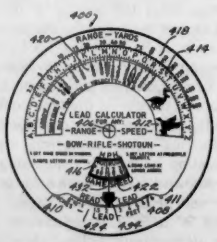
(d) said support member being directly secured to the external surface portions of said foil loops and said thin plastic sheet between said foil loops by an autogenous bond to form a resilient unitary structure generally C-shaped in cross section, capable of being snapped onto a tube the outer diameter of which approximately corresponds to the inner diameter of the profile of said unitary structure; and

(e) said foil loops being protectively sandwiched between said thin plastic sheet and said support member.

4,329,570
LEAD CALCULATOR

Laurel A. Koll, Ruleville, Miss., assignor to LeadRite Corporation, Ruleville, Miss.

Filed Feb. 12, 1979, Ser. No. 11,673
Int. Cl.[3] G06C *27/00*
U.S. Cl. 235—78 R **22 Claims**



1. A lead calculator for calculating the required lead in predetermined units of linear distance as a function of target speed, target range, and projectile speed for shooting at a moving target comprising:

a fixed member and a slide member moveable with respect to said fixed member; and

at least four scales including

a first logarithmic scale with indicia representing target range along a line of sight from the projectile launching point to the point of intended impact,

a second logarithmic scale with indicia representing target speed,

a third logarithmic scale with numerical indicia representing required lead; and

a fourth logarithmic scale with indicia representing projectile speed;

said first, second, third and fourth scales being disposed on at least one of said fixed and slide members in physical proximity so that they are correlated;

a non-logarithmic reference scale disposed on the other one of said members;

said first and third scales having indicia of differing predetermined units of linear distances;

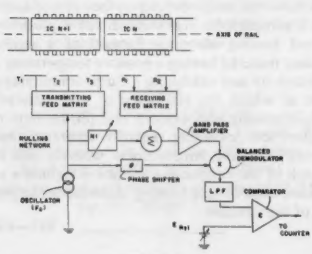
said slide member having indicia means disposed thereon for marking the calculation of required lead in terms of distance, perpendicular to the line of sight;

said calculation requiring moving said slide member relative to said fixed member at least one time so as to align said first, second and third scales so that the required lead may be readily determined.

4,329,571
COUNTING WITH PLURAL ELECTRIC FIELDS

John S. Gerig, 1916 Isaac Newton Sq. West, Reston, Va. 22090

Filed Apr. 17, 1979, Ser. No. 30,800
Int. Cl.[3] G06M *9/00*
U.S. Cl. 235—92 PK **7 Claims**



1. Integrated circuit counting apparatus comprising plural electrodes, at least one of the electrodes connected to field creating means for creating different fields, at least one other electrode connected to a field receiving means for receiving fields, and count producing means connected to field creating means and field receiving means for producing a count which indicates passing of an integrated circuit near the plural electrodes, wherein the field creating means comprises

an oscillator,

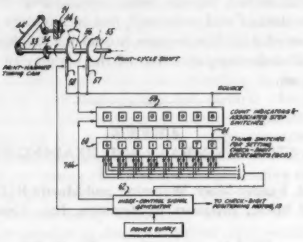
a transmitting feed matrix connected to the oscillator, and wherein the plural electrodes comprise

first and second transmitting electrodes connected to the transmitting feed matrix for out-of-phase excitation of the first and second transmitting electrodes.

4,329,572
CHECK-DIGIT PRINTING MEANS

Vincent Lovrich, Waldwich, and George J. Sundell, River Edge, both of N.J., assignors to Autographic Business Forms, Inc., Mahwah, N.J.

Division of Ser. No. 971,107, Dec. 19, 1978, Pat. No. 4,236,446, Continuation-in-part of Ser. No. 879,595, Feb. 21, 1978, abandoned. This application Apr. 11, 1980, Ser. No. 139,587
Int. Cl.[3] G06M 3/12
U.S. Cl. 235—92 EC 3 Claims



1. In a sequence-counting apparatus having a multiple-digit decimal serial-number counting capacity, said apparatus having input means adapted to respond to sequential condition changes to be counted as sequential-unit increments in serial-number count, said apparatus having means to indicate the current serial-number count thereof, the improvement which comprises check-digit indicating means associated with said serial-number count indicating means, said check-digit indicating means including a check-digit indicator having a synchronizing connection to said input means for currently providing check-digit indications in accordance with the serial-number count condition of said apparatus and as required by a particular weighted-modulus system of computing check-digits, said check-digit indicating means including decimal- indexing drive means for said check-digit indicator, an indexible cyclic storage device having a number of discrete storage units per cycle corresponding to the particular modulus number involved, said storage device producing an output reflecting the currently indexed storage condition thereof, a plurality of control devices having control connection to said storage device and settable uniquely for each digit position within the serial-number capacity of said counting apparatus, said control devices being preset to determine different unit-indexing control of said storge device in accordance with the requirements of the particular weighted-modulus system, means responsive to the instantaneous serial-number setting of said counting apparatus and determining which decimal digit position of the serial number undergoes a single-digit change other than to zero for each successive increment in serial-number count, said last-defined means producing for each successive increment in serial-number count an output connection to that particular control device which is uniquely set for the particular decimal digit position undergoing the single-digit change other than to zero, and a control connection from said storage device to said decimal-indexing drive means, whereby said check-digit indicator will automatically reset in synchronism with each successive increment in serial-number count, thus providing check-digit indications in accordance with the currently indexed condition of said storage device.

4,329,573
CODED OPTICAL IDENTIFICATION SYSTEM

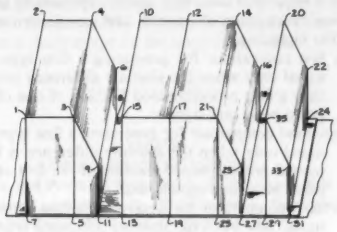
Leonard B. Greene, 944 Bayberry Dr., Arnold, Md. 21012

Filed Apr. 18, 1980, Ser. No. 141,669
Int. Cl.[3] G06K 7/10; G02B 5/14
U.S. Cl. 235—454 8 Claims

1. A coded optical identification device comprising:

(a) a substantially linear array formed by a plurality of three dimensional planar and sloping segments of substantially equal linear width adapted for mounting on an object to be identified,

(b) said planar segments having a first substantially planar surface thereon,



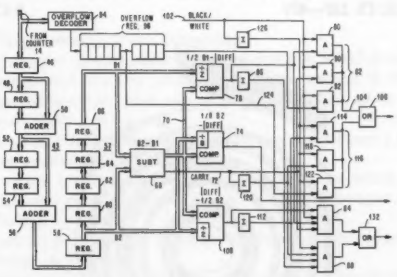
(c) said sloping segments having a first sloping surface sloping toward said object to be identified in the direction of said linear array,

(d) said first sloping surface also being at an acute angle relative to a line perpendicular to said first planar surface.

4,329,574
BAR CODE CANDIDATE SELECT CIRCUIT

Alex Jordan, Jr., Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,978
Int. Cl.[3] G06K 7/10
U.S. Cl. 235—463 10 Claims



1. For use with a scanner capable of generating a train of square wave pulses indicative of bar coded indicia on a surface being scanned, apparatus for generating a framing signal for a label having C characters where each character consists of N successive pulses, said apparatus comprising:

a pulse width counter for measuring the width of each pulse in the train as a function of the number of constant frequency pulses occurring between the leading and trailing edge of the pulse;

an accumulator circuit connected to the output of said pulse width counter for generating a stream of basic unit signals, each of said signals having a value proportional to the combined duration of N successive pulses beginning at a different pulse in the train;

a subtractor circuit having first and second inputs from said accumulator circuit for subtracting a second basic unit signal from a first, contiguous non-overlapping basic unit signal, said subtractor circuit having an absolute difference output and a carry output, the carry output having a first value when the first basic unit signal is greater than the second basic unit signal and a second value when the

second basic unit signal is greater than the first basic unit signal;

a comparator circuit having inputs from said subtractor circuit and said accumulator circuit for determining whether predetermined relationships exist between two non-sequential basic unit signals representing contiguous, non-overlapping characters, said comparator circuit further including:

a first comparator for generating a first type of output signal only when the absolute difference output is less than a first predetermined fraction of one of the compared basic unit signals,

a second comparator for generating a first type of output signal only when the absolute difference is less than a second predetermined fraction of the first of the compared basic unit signals, and

a third comparator for generating a first type of output signal only when the absolute difference is greater than the second predetermined fraction of the second of the compared basic unit signals;

means for storing the signals generated by said comparator circuit during the examination of (N×C) successive basic unit signals; and

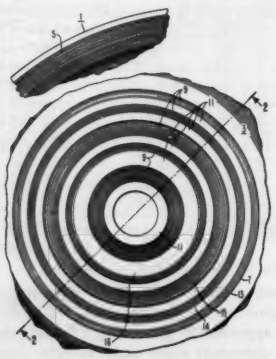
means for logically combining selected outputs from said storage means to produce a framing signal when a first type of output signal appears concurrently at the selected outputs from said storage means.

4,329,575

VIDEO DISC HAVING A LABEL FOR IDENTIFYING MATERIAL RECORDED THEREON

William R. Roach, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,852
Int. Cl.³ G06K *19/06*; G11B *7/24, 23/40*
U.S. Cl. 235—487 **8 Claims**



1. A disc record for storing information signals of a given program, said disc record comprising:

a first annular area on a surface of said disc having an information track therein comprising elements corresponding to the information signals stored on said disc record; and

a second annular area on said surface of said disc having a first plurality of surface regions and a second plurality of surface regions, said second annular area being concentric with said first annular area and positioned such that the outer diameter of said second annular area is less than the inner diameter of said first annular area;

said first plurality of surface regions having a surface effect for deflecting light in a first direction;

said second plurality of surface regions having a surface effect for deflecting light substantially away from said first direction;

each of said first plurality of surface regions alternating with each of said second plurality of surface regions to form a pattern of concentric annular surface regions having regions of said first surface effect interleaved with regions of said second surface effect;

each of said surface regions having a dimension representative of an element of a digital code, surface regions of a first dimension being representative of a first code state and surface regions of a second dimension being representative of a second code state;

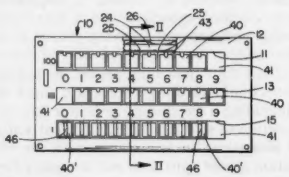
each of said surface regions of said pattern of concentric annular surface regions being dimensioned to identify a given state of said code such that said pattern of concentric annular surface regions provides a machine readable digital code representative of the identity of said given program.

4,329,576

DATA STORAGE MEANS AND READING SYSTEM THEREFOR

Clayton H. Vander Meer, Wyoming, and Martin R. Doane, Ada, both of Mich., assignors to Rapistan, Inc., Grand Rapids, Mich.

Filed Nov. 5, 1979, Ser. No. 91,598
Int. Cl.³ G06K *19/06, 7/10*
U.S. Cl. 235—489 **21 Claims**



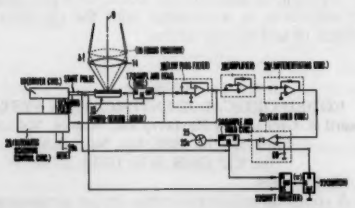
1. Code carrying means for attachment to articles including at least one selectively reprogrammable series of data indicia locations and wherein said at least one series includes a predetermined pattern of indicia aligned in predetermined relationship with respect to said data indicia locations and different than that of said data indicia locations for providing signals used for data reading accuracy checks.

4,329,577

FOCUS DETECTING DEVICE WITH PHOTO-SENSOR ARRAY

Noriyuki Asano, Kawasaki; Yukichi Niwa; Mitsutoshi Ohwada, both of Yokohama; Takaaki Yamagata, Tokyo, and Shin Tsuda, Kawagoe, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 819,235, Jul. 26, 1977, abandoned. This application Dec. 29, 1978, Ser. No. 974,421
Claims priority, application Japan, Jul. 27, 1976, 51/89492
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—201 **64 Claims**



1. A focus detecting device for detecting the focusing of an

image forming optical system on an object, said optical system having an optical axis and being adjustable along the axis so as to form an image of the object on a predetermined focusing plane, said device comprising:

(A) photo-sensor array means having a plurality of electric charge storing type photo-sensor elements, said array means being disposed at a position substantially corresponding to said focusing plane;

(B) driver circuit means for electrically driving said photo-sensor array means, said driver circuit means being electrically coupled to the array means to provide the array means with intermittent start pulses at cyclical intervals and intermittent scanning pulses and for causing the array means to produce, one after another in time series, outputs of electric charge stored in each photo-sensor element during a period of time corresponding to the cyclical interval of said start pulses; the electric charge being stored in each photo-sensor element corresponding to the brightness of the portion of the image appearing at the photo-sensor element within said period of time;

(C) signal processing circuit means for processing the output signal of said photo-sensor array means, said processing circuit means being electrically coupled to the array means to provide an electrical output representative of the focusing condition of the optical system relative to the object, on the basis of said output signals of the array means;

(D) control circuit means for adjusting the scanning recycle time duration in correspondence to the brightness of the object, said control circuit being electrically coupled to said driver circuit means to accomplish the adjustment of the scanning recycle time duration by adjusting the cyclical interval of said start pulses to be applied to said array means in correspondence to the brightness of the object; and

(E) said control circuit means including means for detecting the brightness of at least a portion of the image appearing at the photo-sensor array means within a period of time, means for establishing a range of reference values and control means for adjusting the scanning recycle time duration in response to said detecting means detecting that the instantaneous brightness of at least a portion of the image appearing at the photo-sensor array means deviates from the predetermined range of reference values.

4,329,578

OPTICAL IMAGING SYSTEM HAVING VARIABLE FOCAL LENGTH

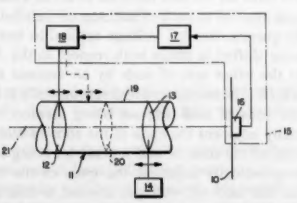
Ortwin Rosner, Munich, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke GmbH & Co., Brunswick, Fed. Rep. of Germany

Filed Jun. 6, 1980, Ser. No. 157,035

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925906

Int. Cl.³ G03B *3/00*

U.S. Cl. 250—201 **14 Claims**



1. An optical imaging system of variable focal length including a lens system (**11**) for forming an image in a fixed image plane (**10**) with at least two series-connected lens components (**12, 13**) located along the optical axis, the positions of the two lens components (**12, 13**) being variable, and including an adjusting device (**14**) for setting the focal length of the lens system (**11**), said imaging system comprising

said adjusting device (**14**) comprising means for acting on one of the two lens components (**12, 13**) independently of the other of said two lens components (**13, 12**), and

a focusing device (**15**) coupled at least with the other one of said lens components (**13, 12**) to focus the lens system (**11**) to form a sharp image on the image plane (**10**).

4,329,579

TARGET SEEKING DEVICE

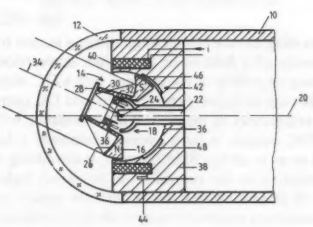
Dirk Jansen, and Friedrich Keller, both of Überlingen, Fed. Rep. of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen, Fed. Rep. of Germany

Filed May 22, 1980, Ser. No. 152,221

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1979, 2923547

Int. Cl.³ G05D *1/12*

U.S. Cl. 250—203 R **8 Claims**



1. Target seeking device comprising:

a gyro rotor rotating about its geometrical axis, which rotor is mounted in a way permitting a angular motion of the geometrical axis with two degrees of freedom about a central point of rotation,

a detector arranged stationary with respect to the housing in the central point of rotation,

an optical system arranged on the gyro rotor, by which a field of view of the seeker located in infinity is imaged as field of view image in the plane of the detector,

means for producing a relative motion between field of view image and detector,

a signal evaluating circuit to which the detector signals are applied and which is designed to produce follow-up signals as a function of the target deviation,

means for producing a precession motion of the gyro rotor, to which means the follow-up signals are applied for readjusting the gyro rotor to a target, and

position sensors, which respond to the angular position of the geometrical axis of the gyro rotor relative to the housing,

characterized in that

(a) a torquer (**40**) acting on the gyro rotor (**16**) is provided as means for producing a relative motion between field of view image and detector (**24**), to which torquer scanning signals of a scanning generator (**76**) are applied and which exerts torques on the gyro rotor (**16**), the gyro rotor (**16**) under the influence of said torques executing a motion scanning the field of view of the seeker,

(b) the signals of the position sensors (**42, 44**) resulting from this motion are applied to a torquer (**40**) through a feedback loop (**80**) and

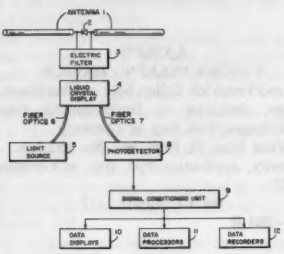
(c) the signals of the position sensors (**42, 44**) together with the detector signals are applied to the signal evaluating circuit (**60**) for producing the follow-up signals.

4,329,580

FIBER OPTIC, LIQUID CRYSTAL DISPLAY ELECTRICAL MEASUREMENT SYSTEM

Leon H. Riley, and George R. Edlin, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 25, 1980, Ser. No. 181,317
Int. Cl.³ G01R *31/00*
U.S. Cl. 250—215 **5 Claims**



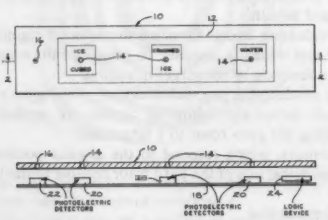
1. A testing device comprising antenna means for detecting the intensity of a field to be measured; conversion means for converting an output of the antenna into a DC output; a liquid crystal havin g its inputs connected to said DC outputs so as to change reflectivity of the crystal in accordance with the value of the DC output; a light means positioned relative to the crystals so as to direct light thereon; transmitting means positioned relative to the crystal so as to detect light that is reflected off of said crystal; and a detector means connected to said transmitting means to receive the light reflected from said liquid crystal.

4,329,581

AMBIENT LIGHT SENSOR TOUCH SWITCH SYSTEM AND METHOD

Robert C. Helfrich, Jr., and Jack E. Francis, Jr., both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 4, 1980, Ser. No. 156,439
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—221 **10 Claims**



1. A control panel for selecting a function relating to the operation of a domestic appliance comprising:

a panel including areas adapted to be touched by a portion of the hand;

a plurality of photoelectric detectors corresponding in number to said areas;

means arranging said photoelectric detectors so that each receives ambient light directed from an associated area;

means for sensing the ambient light associated with one of said photoelectric detectors;

means for comparing the intensity of said ambient light sensed at said one photoelectric detector relative to the intensity of ambient light at the other of said photoelectric detectors;

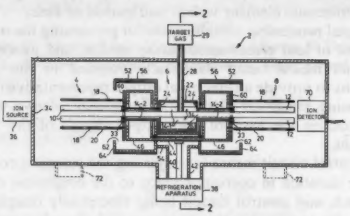
control means operable when the intensity of ambient light directed from an least one of said areas to its associated photoelectric detector is altered relative to ambient light sensed by said one photoelectric detector to operate the selected function.

4,329,582

TANDEM MASS SPECTROMETER WITH SYNCHRONIZED RF FIELDS

J. Barry French, 4 Thornbank Rd., Thornhill, Ontario, and Peter H. Dawson, 2008 Gatineau View Crescent, Ottawa, Ontario, both of Canada

Filed Jul. 28, 1980, Ser. No. 172,592
Int. Cl.³ B01D *59/44*
U.S. Cl. 250—292 **6 Claims**

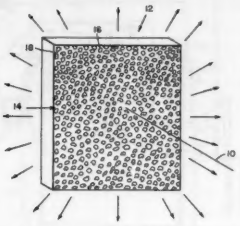


1. A quadrupole mass spectrometer system having a vacuum chamber, first, second and third rod sets in said chamber, each rod set comprising four elongated parallel rods spaced laterally apart a short distance from each other to define an elongated space therebetween extending longitudinally through such rod set for ions to travel through said longitudinally extending space, said first rod set being located end to end with said second rod set and said third rod set being located end to end with said second rod set so that said second rod set is between said first and third rod sets and so that all said spaces are linearly aligned so that an ion may travel through all three of said spaces, the rods of said first set being electrically DC insulated from the rods of said second set, the rods of said third set being electrically DC insulated from the rods of said second set, means for introducing ions into said longitudinally extending space of said first set, means for applying both AC and DC voltages to the rods of said first set for said first set to act as a mass filter, means for applying essentially an AC-only voltage to the rods of said second set for said second set to act as an ion guide, means for introducing a target gas into the space between the rods of said second set and means for removing said gas from said chamber whereby said gas causes dissociation of said ions, means for applying both AC and DC voltages to the rods of said third set for said third set to act as a mass filter, the AC voltages applied to each of said sets of rods being synchronized in frequency, the AC voltage applied to one of said sets of rods being shifted in phase with respect to the AC voltages applied to the other sets of rods by an amount the absolute value of which is between zero and substantially 0.1 cycles, the ends of the rods of said first set being located very closely longitudinally adjacent the ends of the rods of said second set, and the ends of the rods of said second set being located very closely longitudinally adjacent the ends of the rods of said third set so that said AC voltages applied to said three sets of rods produce a continuous radio frequency field extending without substantial interruption along the length of said three rod sets, means for varying independently the amplitude of the AC voltage applied to said first rod set, and means for varying independently the amplitude of the AC voltage applied to said third rod set.

4,329,583
HIGH POWER LASER IRRADIANCE DISPLAY MATERIAL

Raymond W. Conrad, Russellville, and Aryeh Kidron, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 23, 1980, Ser. No. 162,333
Int. Cl.³ H01J *31/49*
U.S. Cl. 250—330 **6 Claims**

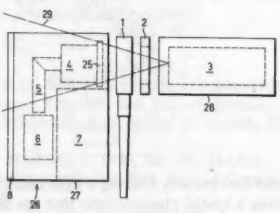


1. A device for the passive location of high power infrared laser beams at remote locations comprising;
   a. a plate;
   b. an absorbing refractory material and a reflecting material with high thermal conductivity disposed on said plate in a mixture whereby said refracting material radiater in the visible portion of the electromagnetic spectrum, in response to impingement by said laser beam, and the surrounding matrix of reflecting material conducts away heat from said refractory material.

4,329,584
APPARATUS FOR RENDERING VISIBLE MOVED OBJECTS

Johann Holzberger, Schöfflisdorf, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Mar. 10, 1980, Ser. No. 128,979
Claims priority, application Sweden, Mar. 27, 1979, 792822
Int. Cl.³ G01M *23/00*; H01J *35/16*
U.S. Cl. 250—358 R **2 Claims**

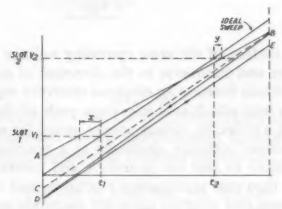


1. An apparatus for rendering visible moved objects within a relatively thick housing, especially projectiles in a firing weapon, comprising:
   an accelerator having a radiation output of about 2000 rad/-minute and at least 300 pulses per second;
   an adjustable oscillation-damped protection cabinet for housing the accelerator which is vibration sensitive;
   an adjustable radiation diaphragm arranged between said accelerator and the objects which are to be rendered visible;
   an adjustable oscillation-damped recording equipment cabinet;
   said adjustable oscillation-damped recording equipment-cabinet comprising:
   lead plates serving as radiation protection means;
   an image amplifier for an image sequence of at least 500 images per second for conversion of the short wavelength radiation into visible radiation;
   a light deflection tube for deflecting the image out of the region of the short wavelength radiation;
   a film camera having an intermittent film transport for at least 500 images per second;
   said protection cabinet for housing the vibration sensitive accelerator comprises a double-trough arrangement containing two troughs; and
   said two troughs forming therebetween a space which is filled with a number of layers of felt-coated elastic balls.

4,329,585
X-RAY TUBE ARRANGEMENTS

Richard G. Gillard, Uxbridge, England, assignor to EMI Limited, Hayes, England

Filed Feb. 22, 1980, Ser. No. 123,755
Claims priority, application United Kingdom, Mar. 21, 1979, 7909847
Int. Cl.³ H05C *1/30*; A61B *6/00*
U.S. Cl. 250—403 **3 Claims**



1. Monitoring means for monitoring repeated deflectional movements, consisting of alternate forward sweeps and flyback movements, executed by the electron beam of an X-ray tube relative to an extended x-ray emissive target member of the tube, the monitoring means including first and second X-ray detector means arranged to receive radiation respectively from first and second locations spaced apart along the path followed by said beam across said target member in performing said deflectional movements, and to generate respective electrical signals when the electron beam occupies said locations, means for utilising said electrical signals to generate respective error signals indicative of departure of the actual deflectional movement of said electron beam from its desired forward sweep movement, means for generating a combined signal consisting of unequal proportions of said respective error signals and means for utilising said combined signal to control the deflection of said beam so that the next flyback movement positions the electron beam correctly for the start of the next forward sweep, and the next forward sweep is of the desired amplitude.

4,329,586
ELECTRON ENERGY RECOVERY SYSTEM FOR NEGATIVE ION SOURCES

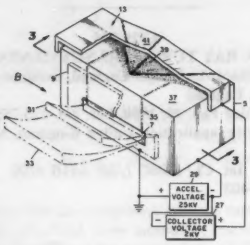
William K. Dagenhart, and William L. Stirling, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 88,223, Oct. 25, 1979, abandoned. This application Sep. 17, 1980, Ser. No. 187,915
Int. Cl.³ H01J *27/00*
U.S. Cl. 250—426 **7 Claims**

1. In a negative ion source for producing a beam of acceler-

ated negative ions including means for generating a magnetic field, a vacuum chamber disposed with said field, a negative ion generator disposed within said chamber and maintained at a negative operating potential relative to said chamber, said ion generator including at least one ion exit opening therein, and an acceleration electrode disposed opposite said ion exit opening of said generator and maintained at a positive potential relative to said ion generator for extracting ions from said generator and generating an electric field transverse to said magnetic field so that electrons exiting said generator with said ions are forced to migrate in a direction transverse to both said electric and magnetic fields, the improvement comprising;

an electron recovery means including an electron collector electrode disposed in uniform spaced relation with a conductive surface of the same operating voltage as said ion generator and transverse to the direction of migration of said electrons forming an electron recovery region therebetween into which said migrating path of electrons are directed, a collector voltage source means for maintaining said electron collector electrode at a potential positive with respect to said ion generator and substantially less positive than said acceleration electrode, said conductive surface and said electron collector electrode each including a non-planar surface contour portion to provide an electric field component in said electron recovery region parallel to said magnetic field to accelerate said electrons in said recovery region into said electron collector electrode within said recovery region.



4,329,587

DEVICE FOR SUPPORTING PATIENT IN PANORAMIC X-RAY RADIOGRAPHY

Timo Nieminen, Helsinki, Finland, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 940,701, Sep. 8, 1978, abandoned. This application Feb. 5, 1980, Ser. No. 118,378

Claims priority, application Finland, Oct. 24, 1977, 773160

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—439 P **3 Claims**

1. A device for supporting a patient during panoramic X-ray radiography comprising:

(a) support structure;

(b) a radiation source;

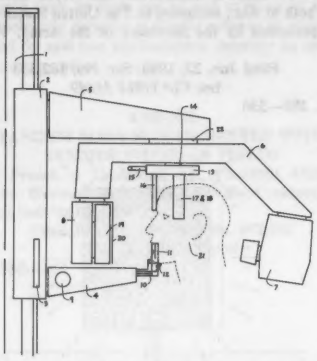
(c) a film holder, said radiation source and said film holder being mounted on said supporting structure on opposite sides of a patient to be radiographed when situated therebetween;

(d) a base having a pair of vertically spaced, horizontally extending arms;

(e) means fixedly secured to the upper arm of said base for supporting the upper portion of the head of a patient;

(f) means movably suspending said supporting structure from the upper arm of said base for rotational and horizontal linear movement relative to said base and the upper arm;

(g) indicator means supported on the lower arm of said base and adapted for horizontal linear movement relative to the lower arm and said base and the patient for indicating the position of the layer to be radiographed in relation to the patient; and



(h) means coupling said indicator means and said movable suspension means for horizontally, linearly moving said movable suspension means in unison with said indicator means.

4,329,588

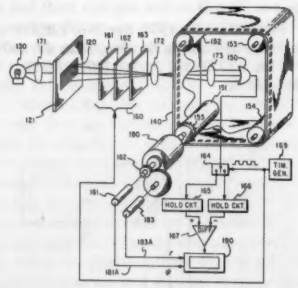
POLARIZATION SWITCHED OPTICAL FILTERING FOR TRANSVERSE TOMOGRAPHY

Harrison H. Barrett; William Swindell, both of Tucson, Ariz., and John E. Greivenkamp, Jr., Cincinnati, Ohio, assignors to University Patents, Inc., Norwalk, Conn.

Filed Mar. 21, 1980, Ser. No. 132,563

Int. Cl.³ A61B *6/00*

U.S. Cl. 250—445 T **9 Claims**



9. Apparatus for optically filtering a light beam with a filter function having a spatial characteristic that has both positive and negative components, and for producing an electronic representation of said filtered light beam, comprising:

a light polarizer and a polarization switcher disposed in the path of said beam;

a polarization sensitive element disposed in the path of said beam, said polarization sensitive element having first and second filter states which respectively represent said positive and negative components of said filter function;

electro-optical sensing means for receiving the filtered beam;

means for combining successive inputs to said electronic electro-optical sensing means; and

means synchronized with said polarization switcher for controlling the polarity of said combining means.

4,329,589
DEVICE FOR POSITIONING RADIOGRAPHIC CASSETTES

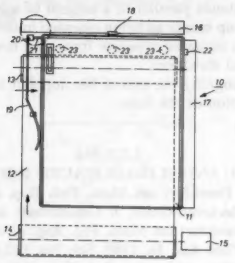
Emile F. Stievenart, Hoboken; Hendrik S. Plessers, Wychmaal; Julianus J. Hellemans, Kontich, and Georges J. Neujens, Merksem, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Mar. 27, 1980, Ser. No. 134,554

Claims priority, application United Kingdom, Mar. 30, 1979, 7911118

Int. Cl.³ G11B *1/00*; B65H *1/22*; B65G *47/00*

U.S. Cl. 250—468 **9 Claims**



1. Apparatus for positioning a radiographic film cassette at an operating station preparatory to the performance of an automatic operation on the cassette or on a film therein, said apparatus comprising a support on which a cassette can be placed at a receiving zone, driving means associated with said support for advancing a cassette from said receiving zone to the operating station, arrest means for arresting further movement of such cassette upon reaching that station, said arrest means including front edge and side edge stops disposed for contact by two contiguous mutually perpendicular edges of a cassette, said driving means incorporating a friction coupling and acting to urge the cassette towards said front edge stop and to continue to exert pressure on the cassette towards the front stop following arrest of the cassette against such stop, sensing means associated with said front edge stop for sensing the arrival of the cassette front edge in the proximity to said front edge stop, and positive displacing means operative in response to the actuation of said sensing means to engage said cassette said remote from said side edge stop and displace said cassette bodily in a direction generally orthogonal to its driving direction against said side edge stop, whereby said cassette is accurately aligned at said operating position.

4,329,590
X-RAY EXAMINATION APPARATUS

Dieter Adelmeyer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

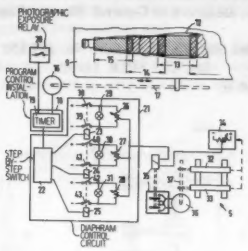
Filed Sep. 5, 1980, Ser. No. 184,526

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1979, 2939425

Int. Cl.³ A61B *6/00*

U.S. Cl. 250—511 **5 Claims**

1. X-ray examination apparatus comprising a patient support, a roentgenographic installation, an x-ray tube which is aligned with respect to the roentgenographic installation, a radiation diaphragm operatively associated with the x-ray tube and having an adjustment motor and a follow-up control for controlling said motor, and a program control installation for effecting the automatic step-by-step displacement of the patient support relative to the roentgenographic installation and relative to the x-ray tube which is aligned with respect to the roentgenographic installation, and a diaphragm control circuit (21, 52 through 56, 61, 65) connected to the program control installation (18, 50), and operable to allocate to each photographic exposure position which is capable of being activated by the program control installation, a separately preselectable



setpoint value for the follow-up control so that the setting of the radiation diaphragm for each photographic exposure position can be preselected.

4,329,591
METHOD FOR DETECTING SAMPLES

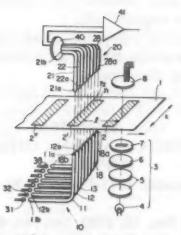
Toshihide Fujiwara, Fuchu, and Nobutaka Kaneko, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,384

Claims priority, application Japan, Jun. 8, 1979, 54-72074

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—548 **2 Claims**

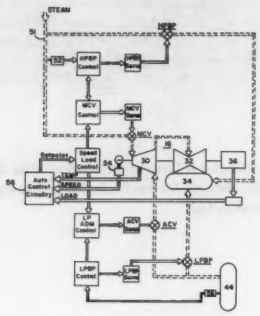


1. A method for detecting samples comprising a step to detect outputs corresponding to a carrier portion free from sample with a plural number of sample detectors arranged in the direction perpendicular to the shifting direction of a carrier, a step to detect outputs corresponding to a carrier portion onto which a sample is applied with said sample detectors, a step to select a sample detector providing the largest difference between the output corresponding to the carrier portion free from sample and that corresponding to the carrier portion onto which the sample is applied as the detector to be utilized for detecting position of the sample, a step to set a standard level for said sample detector selected for detecting position of the sample and a step to detect the end edge of the sample by determining a time at which output from said sample detector selected for sample detection changes from a level higher than the standard level to another level lower than said standard level.

4,329,592
STEAM TURBINE CONTROL

James B. Wagner, Malden, and David M. Priluck, Marblehead, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Sep. 15, 1980, Ser. No. 187,153
Int. Cl.³ F01K *13/02*
U.S. Cl. 290—40 R **20 Claims**



1. In a power plant including a steam turbine connected to a steam source through a steam header and having a main control valve for admitting steam to the steam turbine and a bypass valve for diverting steam around the steam turbine, a method for controlling the steam turbine comprising the steps of:

measuring steam header pressure;

opening the bypass valve at a pressure setpoint floor;

opening the main control valve for speed/load control;

closing the bypass valve to maintain the steam header pressure at the pressure setpoint as the main control valve opens;

transferring from speed/load control to pressure control;

opening the main control valve further to hold the steam header pressure at setpoint as steam flow increases;

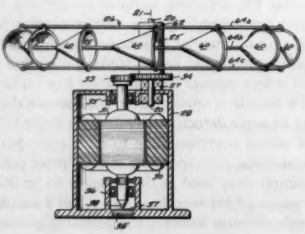
comparing the main control valve position to a reserve set valve position setpoint; and,

adjusting the pressure setpoint to maintain the main control valve position at the reserve set valve position setpoint in the valve open direction.

4,329,593
WIND ENERGY MACHINE UTILIZING CUP IMPELLERS

Robert W. Willmouth, 1011-Frederick-St. S., Arlington, Va. 22204

Filed Sep. 10, 1980, Ser. No. 185,729
Int. Cl.³ F01D *5/14;* **F03D** *9/00*
U.S. Cl. 290—44 **10 Claims**



1. An apparatus for generating electricity from wind currents, the apparatus comprising:

a tower for supporting the apparatus;

a rotational platform mounted on the tower for rotation about a vertical axis;

a generator for generating electricity mounted on the platform for rotation therewith;

a pair of impeller means mounted for rotation about a horizontal axis, which is fixed with respect to the platform, each impeller means including a frame extending in a vertical plane and a plurality of cups secured in spaced relation around the edge of the frame, each of said cups including a concave surface and a convex surface, said frame including a circular member, each of said cups being fastened to said circular member and having an axis which extends parallel to a targent of said circular member, the cup means all being oriented in the same direction;

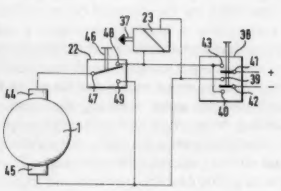
vane means mounted separate from said tower for aligning with wind direction;

means for aligning the axis of the impeller means normal to the direction of the vane.

4,329,594
PIVOTAL AND SLIDABLE AUTO ROOF COVER

Horst Bohm, Frankfurt am Main, Fed. Rep. of Germany, assignor to Rockwell-Golde, a Gesellschaft mit beschrankter Haftung, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 14, 1980, Ser. No. 140,401
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2914864
Int. Cl.³ B60J *7/00*
U.S. Cl. 307—10 R **14 Claims**



1. Apparatus for actuating an automobile roof cover which is slidable and pivotally movable, comprising a reversible electric motor for connection to means for driving a cover of an automobile roof, an energising circuit for the motor including a control switch and a reversing switch for energizing the motor and selecting the opening and closing directions of rotation of the motor, a control element operatively connected to said motor and having a plurality of cam surfaces each associated with a specific position of the cover in which the motor is to be de-energized by means of the control switch, an actuating member at a fixed location relative to the control element and arranged to be displaced by each cam surface when that cam surface is positioned at said fixed location, an actuating element displaceable by the actuating member, said control switch having a switching member displaceable by the actuating element and operable, when the switching member is displaced by the actuating element, to de-energize the motor, resilient biasing means to bias the actuating element to urge the actuating member into the path of the cam surfaces and also to bias the actuating member relative to the switching member, electromagnetic means in the energizing circuit which, when energised, displaces the actuating element against the bias acting on the actuating member relative to the switching member, wherein, in a first position of the actuating element, in which it is held by the energized electromagnetic means, the actuating element is operable to displace the switching member and thereby cause the control switch to de-energize the motor in response to displacement of the actuating member by a said cam surface, and wherein in a second position of the actuating element, in which it is biased by the biasing means with the electromagnetic means de-energized in consequence of the

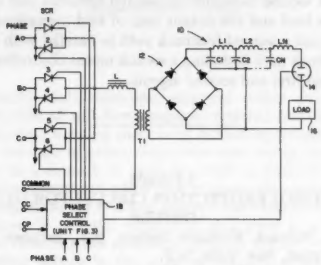
de-energization of the motor, the actuating element holds the switching member in its displaced position until the energizing circuit is again energized.

4,329,595

AC RESONANT CHARGER WITH CHARGE RATE UNRELATED TO PRIMARY POWER FREQUENCY

Harold Watson, Torrance, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1979, Ser. No. 101,339
Int. Cl.³ H02M *7/155*
U.S. Cl. 307—107 **10 Claims**



1. Apparatus for resonant charging of a capacitive load through a series inductance with a charge of selected polarity from a multiphase AC power source in response to command charge pulses at a variable repetition rate unrelated to and unsynchronized with the frequency of said source, comprising

a plurality of separate self-extinguishing switching means for coupling each phase of said multiphase power source to said series inductance, each switching means being adapted to be normally nonconductive, and to be triggered on by a pulse for conduction until the power phase coupled by it reaches a level near zero just prior to crossing over to a half cycle of opposite polarity, and

phase control means responsive to each command charge pulse for monitoring each of said power phases for a period greater than one half cycle of said power source, but less than a full cycle to determine only the next power phase of opposite polarity to cross zero, and at zero crossover of that phase, generating a trigger pulse for turning on the self-extinguishing switching means for a full half cycle coupling the phase then crossing zero to the capacitive load.

4,329,596

DISHWASHER DISPENSER CONTROL

Roque D. Marcade, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 21, 1981, Ser. No. 226,814
Int. Cl.³ B08B *3/00*
U.S. Cl. 307—141.8 **14 Claims**

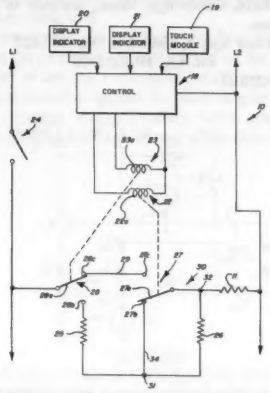
1. In a dishwasher apparatus having an electric heater, an electric detergent dispenser operator, an electric wetting agent dispenser operator, said heater and said operators electrically serially connected, and control means for cyclically operating the dishwasher through washing, rinsing and drying operations, improved circuit means operated by said control means for electrically connecting said heater, said wetting agent dispenser operator, and said detergent dispenser operator selectively between opposite first and second power supply connections, said circuit means comprising:

means for connecting said heater to said first power supply connection;

first switch means for connecting said second power supply connection selectively to (a) said detergent dispenser operator and (b) an electrical connection means;

second switch means for connecting said heater selectively to (c) between said series connected operators and (d) to said electrical connection; and

means for selectively arranging said first and second switch means (e) to connect said heater and said second power supply connection to said electrical connection means to



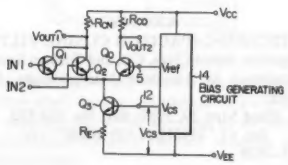
connect said heater directly between said first and second power supply connections for energization of the heater, (f) to connect said detergent dispenser operator directly between said second power supply connection and said heater to energize said detergent dispenser operator and heater concurrently, and (g) to connect said detergent dispenser operator and wetting agent dispenser in series between said second power supply connection and said heater to energize said operators and heater concurrently.

4,329,597

LOGIC CIRCUIT

Akira Yamagiwa, Kanagawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 4, 1979, Ser. No. 81,894
Claims priority, application Japan, Oct. 17, 1978, 53-127527
Int. Cl.³ H03K *19/12;* **H01L** *31/00*
U.S. Cl. 307—455 **16 Claims**



1. A logic circuit comprising current mode logic circuit means including at least an input terminal applied with an input signal, an output terminal delivering an output signal, and a transistor functioning as a source of a constant current, and comprising bias means connected to the base of said constant-current source transistor, wherein said bias means includes a shunt regulation circuit supplying a base bias voltage maintained constant regardless of a variation in a power supply voltage, and a control circuit for controlling said shunt regulation circuit in dependence on a variation in the junction temperature to vary said base bias voltage, and wherein said shunt regulation circuit has a first transistor connected between

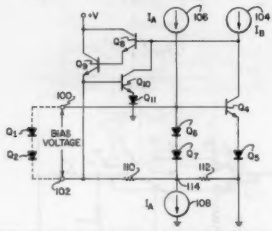
sources of different potentials to apply its collector-emitter voltage to the base of said constant-current source transistor, and first bias means for dividing the collector-emitter voltage of said first transistor to provide the base bias voltage for said first transistor.

4,329,598

BIAS GENERATOR

David R. Welland, Cambridge, Mass., assignor to DBX, Inc., Newton, Mass.

Filed Apr. 4, 1980, Ser. No. 137,427
Int. Cl.³ H03K *3/01*
U.S. Cl. 307—296 R **13 Claims**



1. A bias generator for providing a bias voltage to a circuit, said generator comprising:

signal generating means for generating said bias voltage, said signal generating means comprising means for setting the level of said bias voltage so that said bias voltage varies as a function of the change of the voltage drop across the base-emitter junction of a semiconductive transistor with variations in ambient temperature, said means for setting said level of said bias voltage including means for defining a first reference voltage, means for defining a second reference voltage, means for providing a difference voltage in response to a comparison between said first and second reference voltages, means for generating a multiple signal equal to said difference signal multiplied by a constant k, and means for summing said multiple signal with said first reference signal so as to form said biasing voltage;

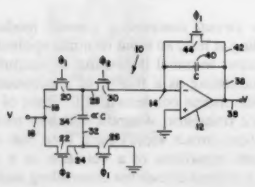
wherein said difference voltage being related to the change in voltage drop across the base emitter junction of at least one semiconductor transistor as a function of the change of temperature.

4,329,599

SWITCHED-CAPACITOR COSINE FILTER

Roubik Gregorian, Santa Clara, CA, and Toshiro Suzuki, Tokyo, Japan, assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed May 29, 1980, Ser. No. 154,573
Int. Cl.³ H03H *11/00*; H03F *1/34*
U.S. Cl. 307—520 **8 Claims**



1. A cosine filter for a sampled-data system adapted to reject extraneous frequency components of an incoming analog signal around a sampling frequency so as to avoid aliasing, said filter comprising;

an operational amplifier having an inverting input lead, a non-inverting input connected to a reference voltage, and an output lead;

a switched capacitor input network connecting the analog input signal to said inverting input lead of said operational amplifier, said input network including a first capacitor and switch means controlled by complementary first and second signals from a first clock and a second clock so that the total charge on said first capacitor at the end of each clock period is the summation of the input voltages at adjacent half cycles; and

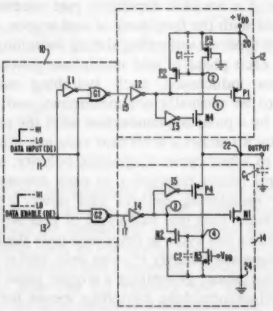
a feedback network including a first feedback path containing a second capacitor connected between said inverting input lead and the output lead of said operational amplifier, and a second feedback path in parallel with said first feedback path including a switch means controlled by one of said first and second signals.

4,329,600

OVERLOAD PROTECTION CIRCUIT FOR OUTPUT DRIVER

Roger G. Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1979, Ser. No. 84,711
Int. Cl.³ H03K *5/00*
U.S. Cl. 307—540 **14 Claims**



1. The combination comprising:

a transistor having first and second electrodes defining the ends of its conduction path and a control electrode;

a power terminal adapted to receive an operating potential;

an output terminal;

negligible impedance means connecting the conduction path of said transistor between said power and output terminals;

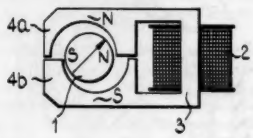
means independent of the voltages at said power and output terminals for selectively applying a turn on signal to the control electrode of said transistor for causing a flow of current between said power and output terminals through the conduction path of said transistor and for driving said output terminal toward the operating potential at said power terminal; and

means coupled to the control electrode of said transistor responsive to the application of said turn on signal and to the potential at said output terminal for substantially decreasing current conduction to a value greater than zero through said transistor only after a given time period if the voltage at said output terminal does not reach a predetermined value within said given time period.

4,329,601
STEPPING MOTOR

Tu X. Mai, Chavannes, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Feb. 20, 1980, Ser. No. 122,955
Claims priority, application France, Feb. 22, 1980, 79 06030
Int. Cl.³ H02K *37/00*
U.S. Cl. 310—49 R **5 Claims**

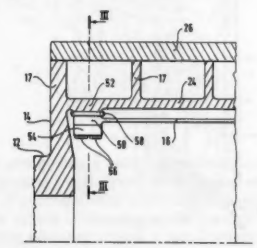


1. Rotary electromagnetic stepping motor comprising a stator formed of soft ferromagnetic material provided with a single exciting winding and a rotor formed by a magnet having at least one pair of poles, stator and rotor being magnetically coupled in a manner to give the rotor a preferred sense of rotation in response to a first type of single alternating polarity pulses applied to the winding wherein the moment of inertia J, the volume V and the number of pole pairs p of the rotor combine to satisfy the relation $J/(V \cdot p^{1,4}) \leqq 5 \cdot 10^{-3}$ kg/m said rotor being driven in the sense of rotation opposite to the preferred sense when the winding receives a second type of doubled pulses of alternating polarity composed of a first pulse portion the polarity of which turns the rotor through an angle less than that corresponding to a step in the preferred sense, said first pulse portion being immediately followed by a second pulse portion of opposite polarity which effects turning of the rotor through a whole step in the sense opposite to the preferred sense.

4,329,602
SUPERCONDUCTING ROTOR

Roger Gillet, Belfort, France, assignor to Alsthom-Atlantique and Electricite de France, both of Paris, France

Filed Sep. 8, 1980, Ser. No. 184,859
Claims priority, application France, Sep. 10, 1979, 79 22553
Int. Cl.³ F16J *15/02*; H02K *9/193, 1/22*
U.S. Cl. 310—52 **7 Claims**



1. A superconducting rotor, said rotor being generally radially symmetrical about its longitudinal axis of rotation and including:

a "hot" shaft part which is rigid and supports the rotor components and including two support structures that are longitudinally separated from each other;

a "cold" inductor part which includes superconducting windings and being borne between said two support structures by mechanical connections;

electrical connection means for feeding power to the windings of the inductor part; and

a cooling circuit for cooling down the inductor part from ambient temperature to a cryogenic temperature and for placing these windings in a superconducting state; the improvement wherein at least one of said mechanical connections between the cold inductor and the hot support structures includes connection means comprising:

an outer ring which is coaxial with the axis of rotation and integral with one of the two parts connected thereby;

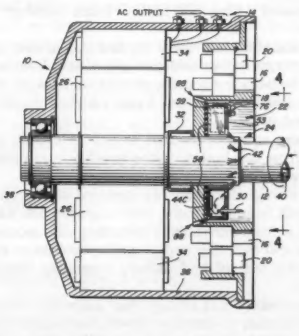
an inner ring which is integral with the other of said two parts and is disposed coaxially against the inner surface of the outer ring; and

fly-weights spaced out angularly and fixed to the inner ring so that the centrifugal force exerted on the fly-weights by rotation of the rotor circumferentially expands the inner ring and presses it against the outer ring to lock these two rings together during rotation while allowing relative longitudinal movement thereof when there is no rotation.

4,329,603
DIRECTLY COOLED, ROTATING RECTIFIER ASSEMBLY FOR A SYNCHRONOUS MACHINE

Welton R. Ballard, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 805,304, Jun. 10, 1977, abandoned. This application May 14, 1979, Ser. No. 38,817
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—61 **6 Claims**



1. In a synchronous rotary electric machine having a rotor with a hollow shaft for the circulation of a coolant, a multiphase AC winding and a DC winding, an improved rectifier assembly connected between the AC winding and the DC winding, comprising:

a carrier plate on said shaft and in a plane generally at right angles thereto;

a plurality of diode wafers mounted on said carrier plate;

a cover for said carrier plate and diode wafers, said cover having an outer periphery;

terminal means in said cover connected with said diode wafers and said carrier plate for connection with said windings;

means for directing a flow of coolant from said shaft outwardly in heat exchange relation with each of said diode wafers; and

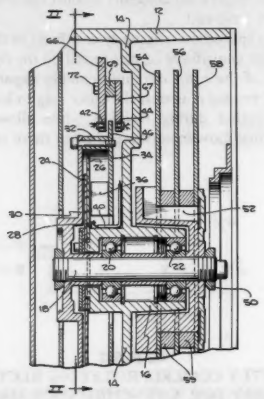
an outlet aperture for the flow of coolant in the outer periphery of said cover.

4,329,604

LOW LOSS BRUSHLESS DC MOTOR

Ericson M. Dunstan, Hidden Hills; William J. Gervais, Northridge, and Bipin V. Gami, Chatsworth, all of Calif., assignors to Micropolis Corporation, Canoga Park, Calif.

Filed Aug. 6, 1979, Ser. No. 63,856
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—68 R **16 Claims**



1. A compact motor and magnetic disc drive assembly comprising:

a fixed heavy hollow frame member;

a thin printed circuit type stator;

means for fixedly mounting said stator on one end of said frame member;

a shaft journaled within said hollow frame member;

a rotor;

means for mounting said rotor on one end of said shaft to extend outwardly past said one end of said hollow frame member, radially outwardly around said stator member and back toward said fixed frame member on the other side of said stator;

a heavy frame member secured to and extending radially outward from said hollow frame member intermediate the ends thereof; and

a magnetic storage disc assembly mounted on the other end of said shaft from said rotor, said magnetic disc assembly including at least one radially extending disc mounted for rotation about the other end of said hollow frame member on the other side of said radially extending frame from said rotor;

whereby said motor and storage disc assembly are isolated from one another to decrease interference and to increase reliability, and form a compact assembly of minimal axial extent.

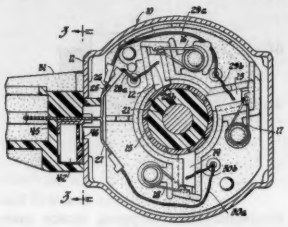
4,329,605

ELECTRIC MOTOR HAVING RADIO FREQUENCY INTERFERENCE RADIATION SUPPRESSION

Donald F. Angi, Dayton, and William D. Cornwell, Jr., Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1980, Ser. No. 196,355
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—68 R **3 Claims**

1. In an electric motor of the type having a commutator and brushes arranged for connection across a supply potential source through respective brush leads, an arrangement for suppressing the radiation of the brush-commutator generated radio frequency interference energy by providing a PI filter for each brush comprising: a first capacitor and a second capacitor for each said brush; a support member of an electrical insulating material effective to support a printed circuit conductor pair for each of said first capacitors and a conducting means on respective opposite sides thereof; means for connecting each said first capacitor across a respective one said printed circuit conductor pair; means extending through said support member for connecting a selected one conductor of each said printed circuit conductor pair to said conducting means; means for connecting the other one conductor of each said printed circuit



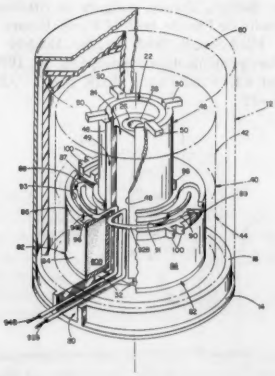
conductor pair to a respective said brush lead whereby the corresponding said capacitor is connected across said brush lead and said conducting means; means for electrically connecting said conducting means to the frame of said motor; and means for connecting each said second capacitor between a respective said brush lead and the frame of said motor in such a manner that there is a selected length of said brush lead between said first and second capacitors that comprises the inductor element of a parallel capacitor PI filter.

4,329,606

ELECTRIC MOTOR CONSTRUCTION

Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Dec. 10, 1979, Ser. No. 102,023
Int. Cl.³ H02K *1/06*
U.S. Cl. 310—71 **19 Claims**



1. A subfractional horsepower, permanent magnet motor comprising

an annular stator assembly comprising a pair of axially aligned annular stator coils in stacked relation, complementary housing members enclosing said coils and defining a series of stator poles equally spaced around the outer periphery of said annular stator assembly, each said housing member having a base plate portion with a central aperture therein,

an elongated sleeve portion disposed within said annular stator assembly and in engagement with the inner periph-

eral surface of each said base plate aperture of said metal housing members to provide with said metal housing members magnetic circuits that surround said stator coils,

a motor frame comprising a base and a core upstanding from said base, a passage in said core for receiving a motor shaft,

the thermal conductivity of said core being significantly greater than the thermal conductivity of said sleeve portion,

said sleeve portion being disposed over and interfitted with said core, an axial channel that extends inside at least one of said stator coils along the axial length of said core to said base,

the leads of said one coil extending radially inward from said one coil into said channel and along said channel to said base and extending therefrom externally of said motor,

a rotor having a cylindrical sleeve portion with a circumferential array of axially extending permanently magnetized rotor poles equally spaced about the periphery of said rotor sleeve,

a motor shaft secured to said rotor and disposed within said passage in said core for supporting said rotor for rotation about said stator assembly with a uniform air gap between the outer surface of said stator assembly and the inner surface of said rotor sleeve.

4,329,607

SYNCHRONOUS ELECTRIC MOTOR WITH VERY LITTLE ROTOR INERTIA AND BALANCED CONICAL MOTION

Claude Rosain, Paris, and Alexandre Torossian, Boulogne Billancourt, both of France, assignors to Societe Francaise d'Applications Industrielles et Rurales d' Electricite (S.F.A.I.R.E.), France

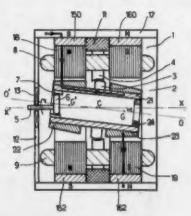
PCT No. PCT/FR79/00033, § 371 Date Dec. 19, 1979, § 102(e) Date Dec. 18, 1979, PCT Pub. No. WO79/00951, PCT Pub. Date Nov. 15, 1979

PCT Filed Apr. 19, 1979, Ser. No. 177,684

Claims priority, application France, Apr. 19, 1978, 78 11473

Int. Cl.³ H02K *7/06*

U.S. Cl. 310—82 **12 Claims**



1. Motor comprising a rotor, of generally cylindrical shape, a stator of generally cylindrical shape having at each extremity a plurality of poles defining with the corresponding extremity of the rotor which is disposed at the interior of the stator, a corresponding plurality of gaps, a stator winding energised and arranged to generate a radial rotating field of the same direction in the gaps of the two respective extremities and means for polarising magnetically the two extremities of the rotor with opposite polarities, in such a manner that each of these latter has a magnetic centre, the virtual axis which joins these two magnetic centres cutting the axis of symmetry of the stator at the centre of symmetry of this latter, characterised by mechanical means, comprising at least one eccentric element (respectively **6** or **35**) mounted on the shaft (**5**), or respectively in the cage of the rotor (**21**) for maintaining at a constant value the angle of inclination of the said virtual axis with respect to the axis of symmetry of the stator, and the coincidence of the centres of symmetry of these two axes, the said means cooperating with at least one member (respectively **7** or **36**) interposed between the eccentric element and the cage of the rotor, or respectively between the eccentric element and the cage of the rotor, or respectively between eccentric element and the shaft permitting the conical movement of the said virtual axis about the said centre of symmetry and according to the said angle without driving any part of the rotor about its axis.

4,329,608

MOUNTING FOR A BELT-DRIVEN GENERATOR

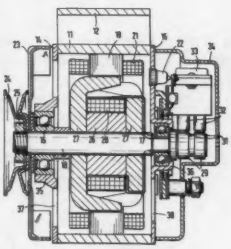
Walter Hagenlocher, Stuttgart; Heinz Hesse, Gerlingen; Rüdiger Sohnle, Stuttgart; Karl Kleebaur, Allmersbach, and Christoph Kugel, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1980, Ser. No. 160,124

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1979, 2925142

Int. Cl.³ H02K *5/00*

U.S. Cl. 310—91 **4 Claims**



1. A belt-coupled electrical machine having a casing, a rotary shaft and a belt-pulley mounted on said shaft for use in a vibratory environment on a saddle-shaped mounting having a seating surface in the shape of a portion of a cylinder of circular curvature, said machine having the improvement which consists that its casing comprises an inner shell (**11**) substantially coaxial with said shaft and an outer cylindrical shell (**12**) affixed or made integral with said inner shell (**11**) and having its axis parallel to said shaft and eccentrically located with reference to said inner shell (**11**), said outer cylindrical shell (**12**) being the same radius of curvature as that of said surface of said saddle-shaped mounting.

4,329,609

ROTOR WITH A DAMPER SCREEN FOR AN ALTERNATOR WITH PROJECTING POLES

Jean Allegre, Belfort; Gilbert Merouge, Bavilliers, and Gilbert Ruelle, Belfort, all of France, assignors to Alsthom Atlantique, Paris, France

Filed Jun. 25, 1980, Ser. No. 163,235

Claims priority, application France, Jul. 19, 1979, 79 18711

Int. Cl.³ H02K *1/10*

U.S. Cl. 310—183 **4 Claims**

1. A rotor for an alternator with a damper screen, said rotor including:

a longitudinal rotation axis;

a magnetic circuit including poles which project radially outwardly, extend longitudinally and are spaced out angularly about the rotation axis, each pole including a polar core and ending radially outwardly in a projecting pole piece whose edges project angularly on either side of the polar core;

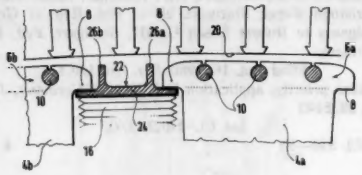
exciter windings positioned between the polar cores;

damper bars formed of a good electrical conductor and extending longitudinally without discontinuity along the whole length of the poles including polar damper bars

extending through the poles and interpolar damper bars disposed between the poles; and

two conductor rings disposed coaxially with the rotor at respective ends thereof and electrically connected to respective ends of each damper bar to form with these bars a damper screen of the squirrel cage type;

the improvement wherein the interpolar bars of said rotor extend longitudinally the length of said poles and each includes:



a shoe which presses against the inside surface of the edge of at least one of the projecting pole pieces, over the longitudinal length thereof; and

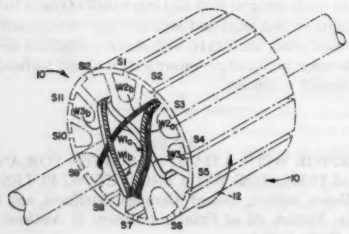
at least one wing integral with the shoe and extending over more than half the radial gap occupied by the neighbouring projecting pole pieces and throughout the longitudinal extent thereof and located adjacent the end of said at least one projecting pole piece edge.

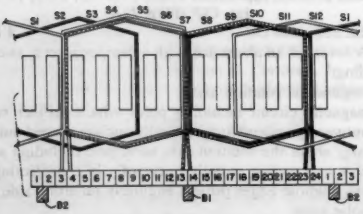
4,329,610

ARMATURE WINDING PATTERN FOR AN ELECTRIC MOTOR

Henry Klein, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Apr. 14, 1980, Ser. No. 140,260
Int. Cl.³ H02K *3/16*
U.S. Cl. 310—220 **26 Claims**





1. An electric motor of the commutator brushtype, said electric motor comprising:

an armature core mounted for rotation about an axis, said armature core having a plurality of slots distributed thereabout;

a commutator defined by a plurality of commutator bars connected to said armature core for rotation therewith;

means for establishing a field for said armature core;

first and second brushes supported for contact with said commutator to effect commutation; and

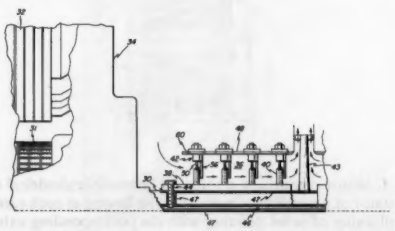
a plurality of armature coils located in said slots, said coils connected to said commutator bars to define an armature circuit, each of said armature coils divided into first and second sub-coils, each sub-coil having first and second coil sides, the sub-coils of each armature coil distributed in said slots so that one of the coil sides of each of said first and second sub-coils of an armature coil shares a common slot and further distributed so that the other coil side of a first sub-coil of an armature coil undergoing commutation by one of said brushes shares a slot with a coil side of a sub-coil of another armature coil about to undergo commutation by the other brush and so that the other coil side of the second sub-coil of said armature coil undergoing commutation by said first-mentioned brush shares a slot with a coil side of a sub-coil of still another armature coil having completed commutation by the other of said brushes.

4,329,611

BRUSHHOLDER APPARATUS FOR DYNAMOELECTRIC MACHINE

Harry O. Ohmstedt, Saratoga Spring; William H. Ruth, Schenectady, and Gerd E. Krulls, Delanson, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 853,259, Nov. 21, 1977, abandoned. This application Jun. 11, 1979, Ser. No. 47,441
Int. Cl.³ H02K *9/28*
U.S. Cl. 310—227 **6 Claims**



1. Apparatus for supporting and manipulating an electrically conductive brush to facilitate an exchange of current between the rotating collector ring of the rotor of a dynamoelectric machine and the conductive brush, comprising:

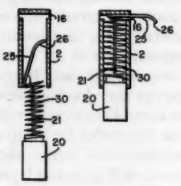
a brushholder assembly having a pair of elongated members for insertion into longitudinal bores in the brush so that the brush is slidably supported and substantially all of the side surface area of the brush is exposed for unimpeded heat transfer with cooling gas near the brush; and

retaining means comprising an open-ended casing concentric with the collector ring and disposed radially outward thereof to removably retain said brushholder in position for directing cooling gas flow between the collector ring and casing to pass over the surface of the brush.

4,329,612
BRUSHHOLDER

Richard R. Averill, Greenfield, Mass., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 23, 1980, Ser. No. 152,795
Int. Cl.³ H01R 39/38
U.S. Cl. 310—247 10 Claims

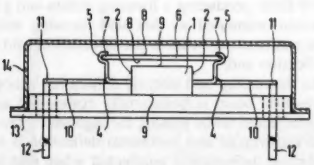


1. A brushholder assembly comprising:
a brushholder of generally tubular form;
an end cap enclosing one end of said brushholder leaving a radial gap partially about said one end of said holder;
a means for reducing said radial gap in at least one portion of said radial gap;
a brush inserted in said brushholder from its other end;
a terminal attached to said brush; and
said terminal securing said brush in said brushholder by insertion of said terminal through said radial gap and rotating said terminal to a position engaging said means for reducing said radial gap.

4,329,613
RESONATOR COMPONENT MODULE

Hermann Kinzel, and Peter Katsch, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 16, 1980, Ser. No. 140,713
Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918952
Int. Cl.³ H01L 41/08
U.S. Cl. 310—344 6 Claims

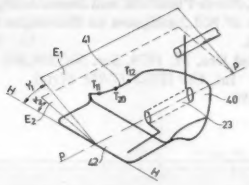


1. A resonator component module comprising:
a dual-in-line package containing at least one integrated circuit on a substrate in a substantially rectangular circuit housing and having a plurality of terminal elements extending from opposite sides of said circuit housing,
opposite central ones of said terminal elements being upwardly bent at a distance along the respective lengths thereof and said central terminal elements having respective ends bent to form a U-shaped receptacle; and
a resonator plate received and supported between said central terminal elements in said receptacles at a distance from said circuit housing; and
a component housing containing said resonator plate and said dual-in-line package.

4,329,614
SEALED-BEAM HEADLIGHT

György Szekacs, Budapest, Hungary, assignor to Egyesült Izzolampa es Villamossagi RT, Budapest, Hungary

Filed Mar. 6, 1980, Ser. No. 127,617
Claims priority, application Hungary, Mar. 7, 1979, EE 2639
Int. Cl.³ H01J 5/16
U.S. Cl. 313—115 12 Claims



1. An electric light source for use in vehicle headlights capable of emitting a dipped beam, comprising a parabolic reflector arranged about a halogen incandescent lamp, with at least one incandescent body of said lamp being arranged inside the reflection space of the parabolic reflector adjacent the focal point of the parabolic reflector and said space being sealed off by a glass plate, a light screen element mounted around the incandescent body emitting the dipped beam, said screen element being effective to prevent the incidence of light on the parabolic reflector within a zone subtending at most 180° with successive planes perpendicular to the axis of the paraboloid of the parabolic reflector, the rim of the screen element being in the shape of a three-dimensional curve such that at most two points of the three-dimensional curve are located in any plane containing the axis of the paraboloid and extending radially from the said axis.

4,329,615
SPARK PLUG FOR INTERNAL COMBUSTION ENGINES

Akira Tanaka; Tadashi Hattori, and Minoru Nishida, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 5, 1980, Ser. No. 146,248
Claims priority, application Japan, Jun. 11, 1979, 54/73659
Int. Cl.³ H01T 13/20
U.S. Cl. 313—141 16 Claims

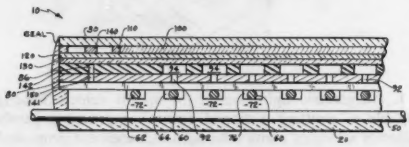
1. A spark plug for an internal combustion engine having at least one combustion chamber comprising:
a center electrode having a discharging forward end face;
a ground electrode having a discharging end face, a free end portion and a bent portion for causing said end face thereof to oppose said forward end face of said center electrode and to position the free end portion on the opposite side of said center electrode from that, adjacent which the bent portion lies;
means for supporting said electrodes such that said discharging end faces oppose each other within said combustion chamber; and
wherein a predetermined portion of the end face of said center electrode projects toward the discharging end face of said ground electrode so as to form a discharge gap

between the center and ground electrodes adjacent the free end of said ground electrode and the side of the center electrode remote from the bent portion of said ground electrode.

4,329,616
KEEP-ALIVE ELECTRODE ARRANGEMENT FOR DISPLAY PANEL HAVING MEMORY

George E. Holz, North Plainfield, and James A. Ogle, Neshanic Station, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 31, 1979, Ser. No. 108,805
Int. Cl.³ H01J *17/00, 61/00*
U.S. Cl. 313—198 13 Claims

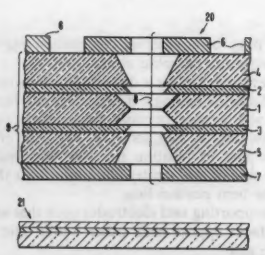


1. A display panel comprising
an array of D.C. gas discharge cells disposed in a first layer and an adjacent array of A.C. gas discharge cells disposed in a second layer, the D.C. cells being in gas communication with the A.C. cells,
the D.C. gas discharge cells including a column of reset cells and succeeding columns of scanning or priming cells,
the A.C. cells including an electrode insulated from the gas therein and an apertured D.C. electrode,
a keep-alive arrangement including a keep-alive A.C. electrode and a portion of said D.C. electrode, and
means for applying A.C. signals between said keep-alive A.C. electrode and said D.C. electrode to cause a glow discharge and the generation of excited particles, the excited particles being generated adjacent to said reset cells to facilitate the firing thereof,
there being one aperture in said D.C. apertured electrode for each A.C. cell and auxiliary aperture means in said D.C. apertured electrode for said keep-alive arrangement to permit excited particles generated whereby to reach said column of reset cells.

4,329,617
CONTROL PLATE FOR A FLAT PLASMA SCREEN

Burkhard Littwin, Hohenschaeftlarn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 5, 1979, Ser. No. 82,168
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844512
Int. Cl.³ H01J *1/88, 19/42*
U.S. Cl. 313—268 13 Claims

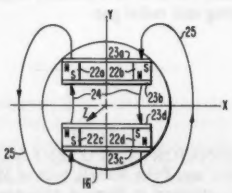


1. In a control plate for a matrix drive of individual picture points formed by intersecting rows and columns of control electrodes of the control plate on a screen of a flat plasma display device, said control plate having a carrier plate consisting of at least partially electrically insulating material, said carrier plate carrying on one plate surface control electrodes corresponding to the rows of the picture points, said control electrodes being parallel to one another and electrically insulated from one another, and said carrier plate on the other plate surface carrying control electrodes corresponding to the columns for the picture points, said control electrodes for all columns being perpendicular to the control electrodes for all rows, parallel to one another and electrically insulated from each other, said carrier plate having a control aperture which passes through the control electrodes at each point of intersection of said control electrodes for all rows and columns, the improvements comprising the carrier plate being constructed of at least three layers with a central layer being a continuous metallic layer and being disposed between two outer layers consisting of electrically insulating material.

4,329,618
HORIZONTAL DEFLECTION ENHANCEMENT FOR KINESCOPES

Kern K. N. Chang, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 29, 1980, Ser. No. 154,602
Int. Cl.³ H01J *29/68, 29/76*
U.S. Cl. 313—431 7 Claims



1. In a kinescope having a screen, an electron gun for producing at least one electron beam and a deflection system for horizontally and vertically deflecting said electron beam to horizontally and vertically scan said screen, an improvement for enhancing the horizontal deflection comprising:
a quadrupole lens having internal and external fields, said internal fields producing a focusing action and a defocusing action orientated so that said focusing action converges said electron beam in the direction of said horizontal deflection and;
means for decreasing said internal defocusing action so that said electron beam is horizontally converged and vertically unaffected while passing through said internal fields of said quadrupole and horizontal deflection is increased and vertical deflection is unaffected when said beam encounters said external fields when exiting from said quadrupole.

4,329,619
DIRECT-VIEW STORAGE TUBE WITH MULTIPLE PATH TARGET ELECTRODE

Masamichi Kimura, Ibaraki, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

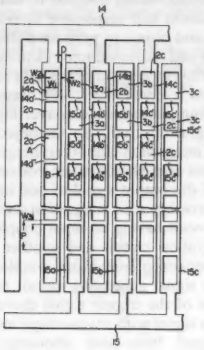
Filed May 12, 1980, Ser. No. 149,013
Claims priority, application Japan, May 18, 1979, 54-61861; Jun. 20, 1979, 54-77796
Int. Cl.³ H01J *29/10, 29/28*
U.S. Cl. 313—470 3 Claims

1. A direct-view storage tube characterized by the provision of a target electrode comprising

an array of first phosphor strips capable of emitting a first color,

an array of second phosphor strips capable of emitting a second color and interlaced or interleaved with said array of first phosphor strips,

a first comb-shaped conductor film having a plurality of teeth each of which surrounds each of said first phosphor strips and is brought into electrical contact therewith,



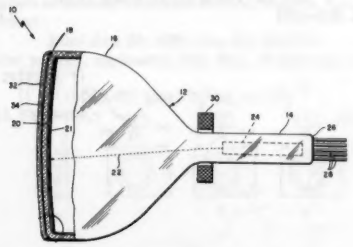
a second comb-shaped conductor film having a plurality of teeth each of which surrounds each of said second phosphor strips and is brought into electrical contact therewith, and each of said teeth of said first and second conductor films being in the form of a ladder with parallel-side-piece strips and cross-piece strips which divides each of said first or second phopshor strip into a plurality of phosphor lands.

4,329,620

CATHODE RAY TUBE WITH LIGHT TRANSPARENT PANEL AND ADHESIVE THEREFOR

Ralph L. Lanciano, Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 23, 1979, Ser. No. 14,784
Int. Cl.³ H01J *29/87, 29/89*
U.S. Cl. 313—478 **22 Claims**



1. A device comprising:

a body having a viewable portion;

a light transmissive layer of gelled adhesive material having a surface bonded to the viewable portion of the body and having an opposing surface, the gelled adhesive material comprising a mixture of transparent epoxy resin, a hygroscopic transparent curing agent, and a light transmission stabilizing agent consisting of a predetermined additive quantity of water; and

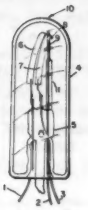
a transparent laminate disposed over the light transmissive layer and bonded to the opposing surface thereof.

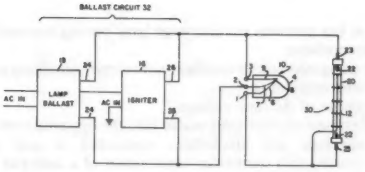
4,329,621

STARTER AND DISCHARGE LAMP STARTING CIRCUIT

Nikolaos Barakitis, Haverhill, and Sheppard Cohen, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 15, 1980, Ser. No. 216,874
Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96*
U.S. Cl. 315—47 **10 Claims**





1. A glow starter device comprising an hermetically sealed glass envelope having three lead-in wires extending therethrough; a gas within said envelope at subatmospheric pressure; a first bimetal within said envelope mounted on a first one of said lead-in wires; a second bimetal within said envelope mounted on an second one of said lead-in wires, said bimetals being electrically and mechanically connected together at one end; and a rigid conductive member within said envelope mounted on a third one of said lead-in wires; said bimetals being disposed to make electrical contact with said rigid conductive member at the connected-together end of the bimetals at normal room temperature and in the absence of energization of the lead-in wires, and said bimetals being operative to separate from said rigid conductive member at a predetermined elevated temperature such as caused by electrical current flowing through one or both of said bimetals.

6. A discharge lamp starting circuit comprising, in combination:

a ballast circuit having an input connected to a source of AC line voltage and a power output;

a glow starter device having a first terminal connected to a first bimetal, a second terminal connected to a second bimetal, and a third terminal connected to a rigid conductive member, said bimetals being electrically connected together at one end which makes a normally closed contact with said rigid member in the quiescent state of said device;

means connecting the second and third terminals of said starter device across the output of said ballast circuit; and

means for connecting the first and third terminals of said starter device across the terminals of a discharge lamp;

whereby upon initial energization of said ballast, short circuit current through the second and third terminals of said starter device is operative to flex said second bimetal for separating said bimetals from said rigid member to provide an open circuit thereat and a switching transient

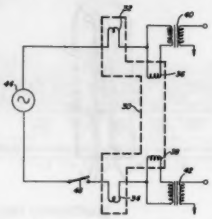
across the lamp, and upon starting of said lamp, the lamp current flow through the first and second terminals of said starter device is operative to maintain said bimetals separated from said rigid member.

4,329,622

LOW PRESSURE GAS DISCHARGE LAMP WITH INCREASED END ILLUMINATION

Stephen C. Corona, and Karl A. Northrup, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 19, 1980, Ser. No. 151,012
Int. Cl.³ H05B *35/00*; H01J *61/96*
U.S. Cl. 315—49 **4 Claims**



1. A low pressure arc discharge lamp having internal ballasting comprising:

an elongated light transmissive envelope containing an ionizable medium therein,

a source of AC line voltage,

a first pair of electrodes sealed into the opposite ends of said envelope and electrically connected to said voltage source, said electrodes constructed of a material having high power and low emissivity,

a second pair of electrodes sealed into the opposite ends of said tube and electrically connected to said voltage source, said second electrode pair constructed of a material having high emissivity and

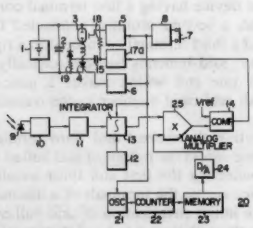
means for electrically isolating said first and second electrode pairs, wherein upon application of said line voltage an ionization discharge of said medium occurs with said first electrode pair providing the necessary impedance to limit lamp operating current while simultaneously providing additional illumination to compensate for illumination falloff at the ends of the lamp.

4,329,623

ELECTRONIC FLASH APPARATUS

Shinichiro Hattori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1980, Ser. No. 134,423
Claims priority, application Japan, Apr. 6, 1979, 54-41602
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—151 **6 Claims**



1. An electronic flash apparatus comprising:

a capacitor;

a flash lamp and a semiconductor switching element connected in series across said capacitor;

trigger circuit means response to application of a trigger signal thereto to trigger said flash lamp and render said semiconductor switching element conductive, to thereby discharge said capacitor and to cause said flash lamp to produce a flash light toward an object to be photographed;

flash control circuit means coupled to said semiconductor switching element and responsive to receipt of light reflected from said object to produce a flash control signal for rendering said semiconductor switching element nonconductive when an amount of the light reflected from the object reaches a given level, said flash control circuit means including photoelectric converting means for converting the light reflected from the object into an electrical signal; an integration circuit for integrating the electrical signal from said photoelectric converting means, the magnitude of the output signal of said integration circuit gradually increasing at an integration time constant; and a comparing circuit having an input coupled to the output of said integration circuit and another input having a reference comparison level signal coupled thereto;

a compensation signal generating circuit means responsive to application of the trigger signal thereto to produce a compensation signal with a waveshape independent of the electrical signal from said photoelectric converting means; and

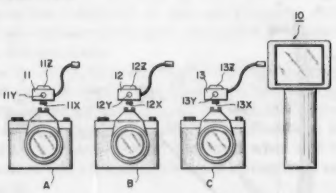
an analog multiplier forming a part of said flash control circuit means and connected between said integration circuit and said comparing circuit for multiplying the output signal of said integration circuit by the compensation signal, said comparing circuit comparing the output of said analog multiplier with said reference comparison level signal such that when the magnitude of the output of said analog multiplier exceeds the reference level, said flash control circuit means produces said flash control signal.

4,329,624

COMPUTER TYPE ELECTRONIC PHOTOFLASH

Akio Kamon, Koganei; Sakyo Nagashima, Kawasaki, and Yuzo Tsuruta, Yokohama, all of Japan, assignors to Kabushiki Kaisha Sunpak, Tokyo, Japan

Filed Jan. 7, 1980, Ser. No. 110,126
Claims priority, application Japan, Mar. 17, 1979, 54-34759[U]; Mar. 19, 1979, 54-34399[U]
Int. Cl.³ H05B *41/32*; G03B *15/05*
U.S. Cl. 315—151 **2 Claims**



1. An adapter for interconnecting a camera and a flash unit wherein the flash unit includes a capacitor, a flash tube, discharge means for discharging said capacitor through said flash tube, and flash-termination means for terminating the discharge of said capacitor through said flash tube, said adapter comprising a set of camera terminals for connection to said camera, a set of flash unit terminals for connection to said flash unit, synchronizing means coupling said camera and flash unit terminals for conveying a synchronizing signal from said camera to said photoflash unit for initiating operation of said discharge means, photometric means in said adapter for responding to reflection of light developed by said flash unit, and a

terminal for said adapter for connection to a terminal of said flash unit for conveying a signal from said photometric means to said flash termination means to initiate operation thereof.

4,329,625

LIGHT-RESPONSIVE LIGHT-EMITTING DIODE DISPLAY

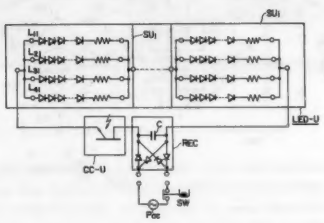
Jun-ichi Nishizawa; Yasuo Okuno, and Keishiro Takahashi, all of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Filed Jul. 17, 1979, Ser. No. 58,545

Claims priority, application Japan, Jul. 24, 1978, 53-90619

Int. Cl.³ H05B *43/00*

U.S. Cl. 315—158 **19 Claims**



1. An outdoor-installed light-responsive diode display comprising:

a light-emitting diode circuit including a plurality of light-emitting diodes connected in series for emitting a large amount of colored light; and

a light-responsive current-controlling circuit responsive to intensity of ambient light and connected in series to said light-emitting diode circuit and including a light-responsive current-controlling element, responsive to said ambient light, for regulating current through said light emitting diode circuit, and varying current through said light-emitting diode circuit such that a larger current flows through said light-emitting diode circuit when exposed to a higher intensity of the ambient light.

4,329,626

PLASMA DISPLAY DEVICE

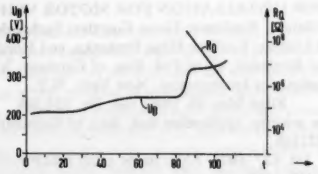
Bernhard Hillenbrand, Uttenreuth; Herbert Mai, Hallstadt, and Karl Schuster, Marloffstein, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,570

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929270

Int. Cl.³ H01J *61/28, 61/12*

U.S. Cl. 315—169.4 **33 Claims**



1. In a plasma display device with a gastight housing, the interior of which contains a gas discharge space which is filled with an ionizable gas at a predetermined pressure and in which an electron and/or photon generating gas discharge is developed between at least one cathode of aluminum with, optionally, a small amount of other elements and at least one further electrode, said display device also including means for addressing the picture elements of a flat picture screen, the improvement comprising:

(a) hydrogen being provided as the ionizable gas;

(b) a cathode which is coated with a thin film of an aluminum oxide; and

(c) means to maintain the cathode continuously coated with said thin film of an aluminum oxide during the gas discharge.

4,329,627

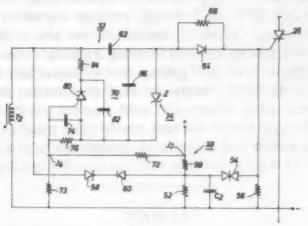
HIGH FREQUENCY THYRISTOR CIRCUIT FOR ENERGIZING A GASEOUS DISCHARGE LAMP

Kenneth P. Holmes, Austin, Tex., assignor to Esquire, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 12,294, Feb. 15, 1979, which is a continuation of Ser. No. 773,287, Mar. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 700,222, Jul. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 654,926, Feb. 2, 1976, abandoned. This application May 8, 1980, Ser. No. 148,008

Int. Cl.³ H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **6 Claims**



1. A circuit for generating a high frequency signal to a load, comprising

a resonating circuit connected to the load,

a thyristor connected to the resonating circuit such that when said thyristor is gated on, the resonating circuit naturally commutates said thyristor at a natural commutation interval,

a voltage adjusting circuit connected to said thyristor for providing energy to said resonating circuit when said thyristor is gated on to initiate oscillations in said resonant circuit for driving the load at high frequency,

said energy to said resonating circuit being a pulse,

said voltage adjusting circuit also providing a potential to said thyristor which changes to a lower value after said thyristor is gated on to thereby ensure non-conductive latching of said thyristor by lengthening said natural commutation interval, and

gate energizing means for abruptly forward biasing the gate of said thyristor for turn on thereof, and abruptly negatively biasing the gate of said thyristor following reversal of the rate that said pulse changes from a rising pulse to a declining pulse.

4,329,628

RELAXATION OSCILLATOR TYPE SPARK GENERATOR

John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

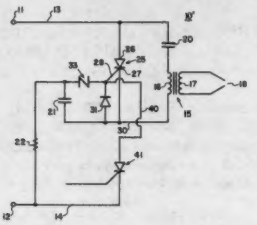
Filed Jul. 31, 1980, Ser. No. 174,084

Int. Cl.³ H05B *37/02*

U.S. Cl. 315—209 SC **8 Claims**

1. A spark generator, including: spark generator transformer means having a primary winding and a high voltage secondary winding with said secondary winding adapted to be connected to a spark gap for ignition of a fuel; a pair of input conductors

for said spark generator wherein said spark generator is adapted to be connected to an alternating current potential source; a pair of capacitors and said transformer primary winding connected in a series circuit between said pair of conductors; a first of said capacitors being an energy storage capacitor for said spark generator and a second of said capacitors being a gating control capacitor for said spark generator; solid state switch means having current carrying circuit means, and said switch means including gate means to control said switch



means; said current carrying circuit means being connected in parallel circuit with said energy storage capacitor and said primary winding; threshold switch means and a diode connected to said gate means and forming a gating circuit which is in a shunt circuit with said gating control capacitor; said diode including connection means to further connect said diode between said gate means and said current carrying circuit means; and asymmetric current conducting means connected to said gate means and one of said conductors to provide a low impedance charging path for said energy storage capacitor.

4,329,629

LIGHT SOURCE UNIT HAVING A NUMBER OF FLASH TUBES

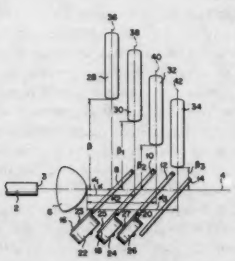
Syuichi Takayama, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,175

Claims priority, application Japan, Mar. 2, 1979, 54-24146

Int. Cl.³ A61B *1/06*; H05B *41/34*

U.S. Cl. 315—323 **11 Claims**



1. A light source unit for supplying light of a desired amount to a specified region, comprising:

a number of electric flash tubes which are successively caused to emit light;

a corresponding number of light reflecting members for reflecting the light beams from respective electric flash tubes and for supplying the light beams in a common optical path, said light reflecting members being prearranged in said common optical path in the order of light beam reception from said electric flash tubes; and

moving means for successively removing said light reflecting members from said common optical path upon completion of light emission of the corresponding respective electric flash tube, thus ensuring the precise positioning of the optical path for the light beam from the next successive electric flash tube which is to be reflected by the next light reflecting member.

4,329,630

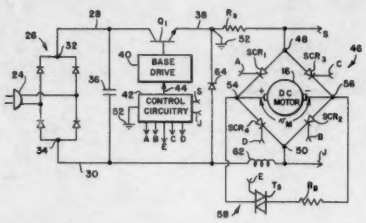
SINGLE TRANSISTOR POWER CONTROL CIRCUIT FOR A DC MOTOR WASHING MACHINE DRIVE

John N. Park, Rexford, N.Y., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 4, 1980, Ser. No. 109,705

Int. Cl.³ H02P *5/40, 3/12*

U.S. Cl. 318—258 **18 Claims**



1. A power control circuit for a DC washing machine drive motor having a pair of DC input terminals, said circuit responsive both to relatively lower frequency motor direction control input signals and to relatively higher frequency chopper duty cycle speed control input signals, and comprising:

a pair of DC supply conductors for connection to a power source;

a chopped DC supply conductor;

a high frequency switching transistor connected in series between one of said DC supply conductors and said chopped DC supply conductor;

a four-leg polarity-reversing thyristor bridge having an opposite pair of input nodes respectively connected to said chopped DC supply conductor and to the other of said DC supply conductors, and having an opposite pair of output nodes connected to respective motor input terminals, such that motor polarity is controlled by activating either one or the other pair of diagonally opposite thyristors; and

circuitry for applying the relatively higher frequency chopper duty cycle speed control input signals to activate said high frequency switching transistor and for applying the relatively lower frequency motor direction control input signals to alternately activate said thyristors in diagonally opposite pairs.

4,329,631

WIPER INSTALLATION FOR MOTOR VEHICLES

Helmut Betsch, Bissingen; Horst Goertler, Sachsenheim; Karl-Heinz Liedtke, Lauffen; Hans Prohaska, and Horst Rachner, both of Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries Incorporated, New York, N.Y.

Filed May 29, 1980, Ser. No. 154,308

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922160

Int. Cl.³ A47L *1/02*; B60S *1/02*; H02P *3/10*

U.S. Cl. 318—466 **8 Claims**

1. A windshield wiper assembly comprising:

a windshield wiper;

a motor for driving said wiper;

an energy source;

an operating switch having at least one on position and an off position;

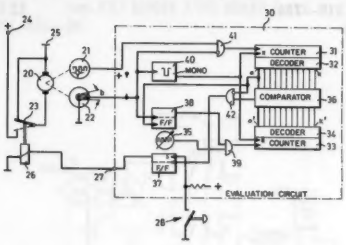
switch means coupled to said energy source and said motor for supplying energy to said motor when a switching

signal has a first state and for deenergizing said motor when said switching signal has a second state;

parking switch means for indicating when said wiper reaches a predetermined position;

indication means for indicating the angular velocity of said motor;

control means responsive to said parking switch means and said indication means for generating a control signal at an



angular position of said wiper after said parking switch means has indicated said predetermined position;

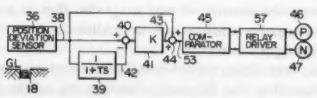
switch control means responsive to said operating switch being in said at least one on position for supplying said switching signal first state to said switch means and further responsive to said control signal and, said operating switch in said off position for supplying said switching signal second state to said switch means at said angular position of said wiper.

4,329,632

RUNNING TRACK CONTROL APPARATUS FOR TRACKLESS MOVING BODY

Yutaka Yoshida; Ryohei Ishige; Hiroaki Yabu, and Yasuo Nabeshima, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1980, Ser. No. 157,157
Claims priority, application Japan, Jun. 15, 1979, 54/74660
Int. Cl.³ G05B *19/36*
U.S. Cl. 318—587 **3 Claims**



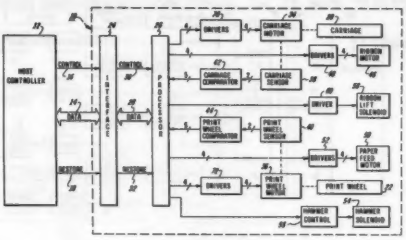
1. An apparatus for controlling the running track of a trackless moving body comprising a guide wire, a position deviation sensor unit mounted on the trackless moving body for sensing a deviation of the position of the moving body relative to said guide wire, a steering control circuit electrically connected to said position deviation sensor unit, and steering drive means electrically connected to said steering control circuit, for steering the moving body, wherein said steering control circuit comprises a first-order lag circuit connected to said position deviation sensor unit to receive the output signal from said position deviation sensor unit, a subtractor connected to said position deviation sensor unit and to said first-order lag circuit to receive the output signal from said position deviation sensor unit and the output signal from said first-order lag circuit, and a comparator connected to said subtractor to receive the output signal from said subtractor.

4,329,633

MOTION DAMPING APPARATUS

John C. G. Dunfield, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 7, 1980, Ser. No. 166,222
Int. Cl.³ G05B *5/01*
U.S. Cl. 318—612 **12 Claims**



1. Apparatus for controlling the movement of a movable element to bring said movable element to rest at a desired stopping position, said apparatus comprising:

a multi-phase drive motor having a drive shaft coupled to said movable element for driving same, a plurality of electrically conductive coils mounted in position displaced relationship about said shaft, and means coupled to said drive shaft and responsive to the selective energization of said coils by respective motor drive signals for causing the corresponding rotation of said drive shaft and movement of said movable element;

a sensor coupled to said drive shaft and responsive to the rotation thereof for generating an electrical signal containing information indicative of the direction, speed and distance of movement of said movable element;

means for detecting from the distance information indicated by said electrical signal whether said movable element is within a predetermined distance of said desired stopping position; and

control means for controlling the levels of said motor drive signals in dependence upon the direction information indicated by said electrical signal following detection of said movable element being within said predetermined distance of said desired stopping position, said motor and thus said movable element being brought to a final stop with only a single one of said motor drive signals and thus corresponding motor coil on, and wherein said single one of said motor drive signals and thus corresponding motor coil is turned on by said control means following detection of said movable element being within said predetermined distance and the two motor coils each adjacent said single one motor coil are selectively alternatively energized or deenergized by said control means, during movement of said movable element toward said desired stopping position, said two motor coils being energized only in the event that said sensor senses that the speed of said movable element is above a predetermined threshold speed.

4,329,634

MOTION SENSING APPARATUS

John C. G. Dunfield, San Jose; Andrew Gabor, Alamo, and Keith L. Gnutzman, Alameda, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

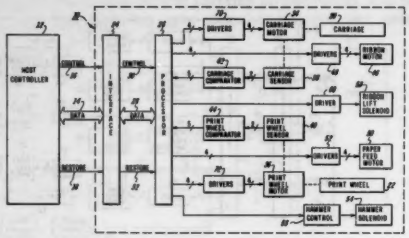
Filed Jul. 22, 1980, Ser. No. 171,078
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—685 **10 Claims**

1. Apparatus responsive to the movement of a movable element for generating a plurality of electrically phase-displaced signals containing information indicative of the direction, speed and distance of movement of said movable element, said apparatus comprising:

a plurality of position-displaced electrically conductive coils;

flux producing means mounted adjacent each of said coils for producing a path of normally substantially constant magnetic flux adjacent each of said coils; and

flux varying means coupled to said movable element and



responsive to the movement of said movable element for varying the level of said magnetic flux adjacent each of said coils in dependence upon the direction, speed and distance of movement of said movable element, whereby the resultant electromotive force induced in each of said coils defines said plurality of electrically phase-displaced signals.

4,329,635

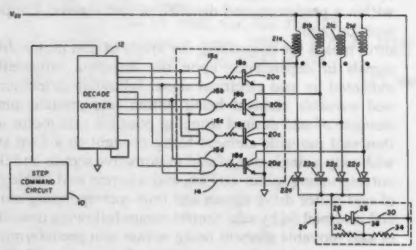
STEPPER MOTOR DAMPING CIRCUIT

Edward J. Reilly, Mayfield Heights, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 3, 1980, Ser. No. 183,843

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—696 **8 Claims**



1. A method for damping the rotational motion of a stepper motor of the type having individual motor windings having intercoil coupling, one side of which is continuously energized and the other side of which is non-energized but is connected to a switching device, said switching device causing current to flow through said coils when said switching device is in one state and causing no current to flow through said coils when said switching device is in a different state, said method comprising the steps of:

a. sensing the voltages of the non-energized side of each of said coils;

b. sensing the voltage of the energized side of said coils;

c. comparing the sensed voltages of each of the non-energized side of said coils to the energized side of said coils; and

d. shunting the non-energized side of each of said coils to said energized side of said coils when the voltage of the non-energized side exceeds some predetermined value greater than the voltage of the energized side.

4,329,636

ROTATION SENSOR DEVICE

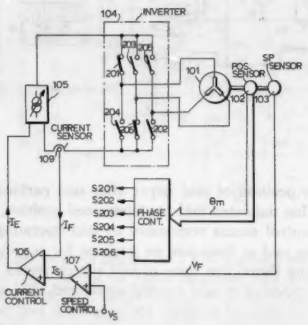
Ryohei Uchida; Tatsuo Yamasaki; Munehiko Mimura; Kosuke Hasimoto, and Sadanobu Kawabe, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1979, Ser. No. 60,058

Claims priority, application Japan, Jul. 25, 1978, 53/91057

Int. Cl.³ H02K *29/00*

U.S. Cl. 318—721 **12 Claims**



1. An electric motor comprising:

a housing;

at least one armature winding fixedly mounted on said housing;

a rotor rotatably mounted in said housing;

field magnet means fixedly mounted on said rotor and including a plurality of magnetic poles of alternating polarity disposed at predetermined angular intervals around said rotor, said field magnet means thereby producing magnetic flux the polarity of which alternates at said predetermined angular interval in the circumferential direction of said rotor;

speed signal forming means fixedly mounted on said rotor along the circumference thereof for increasing and decreasing the density of said magnetic flux at a predetermined angular pitch which is smaller than said predetermined angular interval;

magnetic flux sensor means fixedly mounted on said housing for detecting the magnetic flux density of the magnetic flux which is produced by said field magnetic means and varied by said speed signal forming means, and for producing a waveform signal corresponding to the waveform of the detected magnetic flux density, said waveform signal including a first component having a frequency which is proportional to the rotational speed of said rotor and inversely proportional to said predetermined angular interval, and a second component having a frequency which is proportional to the rotational speed of said rotor and inversely proportional to said predetermined angular pitch;

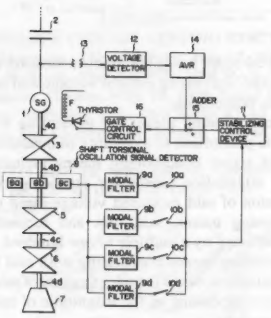
speed sensor means connected to said magnetic flux sensor means and including means for separating said second frequency component from said waveform signal; and

position sensor means connected to said magnetic flux sensor means for detecting the rotational position of said rotor from the first frequency component of said waveform signal.

4,329,637
CONTROL APPARATUS FOR A SYNCHRONOUS MACHINE

Tosio Kotake, Ichikawa; Katuaki Watanabe, Kawasaki, and Kaoru Koyanagi, Yachiyo, all of Japan, assignors to Tokyo Denryoku Kabushiki Kaisha, Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Apr. 8, 1980, Ser. No. 138,284
Claims priority, application Japan, Jun. 1, 1979, 54-68466
Int. Cl.³ H02H 7/06; H02P 9/00
U.S. Cl. 322—20 10 Claims



1. A control apparatus for a synchronous machine comprising:

first means for detecting torsional oscillations signals of a rotatable torsional system including a rotor of a synchronous machine coupled with a power system, at least one rotatable body and a rotatable shaft coupling said rotor and said rotatable body, said first means including a statically provided AC power source, a rotatable transformer connected to said AC power source and coupled with said rotational torsional system, a rotatable rectifier for rectifying the output of said rotatable transformer, a rotatable gauge circuit supplied with a DC power from said rotatable rectifier and detecting a torsional quantity of said rotatable shaft for producing a control signal, an FM oscillator coupled with said rotatable rectifier and controlled by said control signal to produce torsional oscillation signals corresponding to said torsional quantity, and a transmitting antenna for transmitting said torsional oscillation signals;

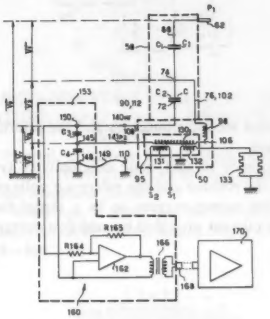
second means for receiving said torsional oscillation signals and producing a torsional oscillation signal having a frequency of a selected particular mode of inherent shaft torsional oscillatory frequencies; and

third means for restricting a sub-synchronous resonance in said rotatable torsional system, said third means including at least one stabilizing control device for adjusting the phase of the output signal from said second means and a field voltage control circuit for controlling the field voltage of said synchronous machine by the output signal from said stabilizing control device.

4,329,638
CAPACITIVE VOLTAGE TRANSFORMERS

Daniel Le Maguet, Orly, France, assignor to Enertec, Montrouge, France

PCT No. PCT/FR80/00007, § 371 Date Sep. 23, 1980, § 102(e) Date Sep. 19, 1980, PCT Pub. No. WO80/01516, PCT Pub. Date Jul. 24, 1980
PCT Filed Jan. 23, 1980, Ser. No. 214,053
Claims priority, application France, Jan. 23, 1979, 79 01575
Int. Cl.³ G05F 1/60
U.S. Cl. 323—233 12 Claims



1. A capacitive voltage transformer for the reduction of a high voltage to a lower representative voltage, including:

an input terminal intended to be connected to a line under voltage;

a first and a second impedance formed respectively by a first and

a second capacitor;

a third and a fourth impedance forming a series circuit and having

a common join;

the second and third impedances having a common end and the said first, second, third and fourth impedances being connected in series between the said input terminal and a point on a reference medium brought in operation to a reference voltage; first means of taking off a voltage between the other end of the second impedance and the join common to the third and fourth impedances; and

second means of producing a voltage signal which is a function of the voltage across the terminals of the series circuit formed by the third and fourth impedances,

the values of the third and fourth impedances with respect to those of the first and second impedances being such that the instantaneous amplitude of the said voltage signal is a predetermined fraction of the input voltage appearing in operation between the input terminal and the reference medium.

4,329,639
LOW VOLTAGE CURRENT MIRROR

Walter L. Davis, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1980, Ser. No. 124,178
Int. Cl.³ G05F 3/20
U.S. Cl. 323—315 7 Claims

1. A current mirror circuit usable with a single cell voltage supply and comprising:

a voltage supply;

a reference voltage source;

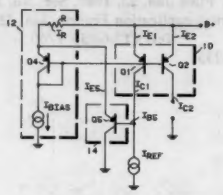
first and second transistors of the same conductivity type with bases coupled together, the second transistor being coupled between the voltage supply and the reference voltage source and supplying an output current:

a first current reference source coupled to the first transistor means;

a resistor coupled to the voltage supply;

diode means coupled between the resistor and the bases of the first and second transistors;

an adjustable current source coupled between the bases of



the first and second transistors and the reference voltage source; and

a third transistor of said same conductivity type coupled between the resistor and the reference voltage source for forcing the output current to be a direct function of a reference current provided by said first current reference source.

4,329,640

VERY LARGE SCALE INTEGRATED CIRCUIT

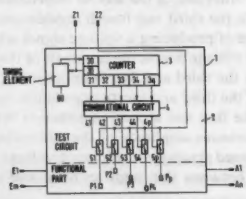
Hans Reiner, Gerlingen, and Werner Auth, Stuttgart, both of Fed. Rep. of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed May 24, 1979, Ser. No. 42,181

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824224; Feb. 9, 1979, 2904874

Int. Cl.³ G01R *15/12*

U.S. Cl. 324—73 R **12 Claims**



1. A monolithic very large scale integrated circuit (VLSI) including an operating portion having a plurality of outer terminals and a plurality of test points, and a testing portion integrated with the operating portion and operative for testing the latter in response to an input signal, said testing portion comprising:

at least one and at most three additional terminals at least one of which is an input terminal of the testing portion;

means for generating a test signal in response to the application of the input signal to said input terminal;

means for monitoring the test points of the operating portion in dependence of the test signal; and

means for providing an output signal containing circuit defect information in response to detection of failure at any one of the test points.

4,329,641

ANALOG-TO-DIGITAL TESTER

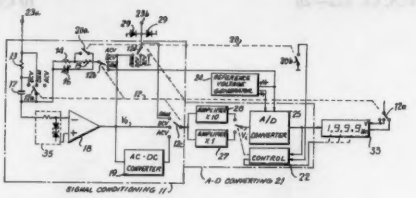
Masayuki Ikeda, and Kenji Aoki, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 701,845, Jul. 1, 1976, abandoned. This application Jan. 5, 1979, Ser. No. 1,336

Claims priority, application Japan, Jul. 1, 1975, 50/81556

Int. Cl.³ G01R *15/08*

U.S. Cl. 324—115 **19 Claims**



1. In a digital tester havig functions to measure at least direct current voltage, alternating current voltage and resistance, the improvement comprising:

a signal conditioning means for generating a DC voltage output in proportion to a quantity of measured input voltage said signal conditioning means including first and second attenuation means for providing two levels of attenuation of said measured voltage input to said signal conditioning means, said first and second attenuation levels differing by a multiple of one hundred, and attenuation switching means cooperating with said first and second attenuation means for selecting one of said attenuation means corresponding to the magnitude of said input voltage measurand,

analog-to-digital (AD) converter circuit means for converting the analog output signal from said signal conditioning means into a digital value, said analog-to-digital converter means including a switching means for changing-over sensitivity of said analog-to-digital converter circuit means to 1/1 or 1/10, by combinations of attenuation and sensitivity levels the ranges of said measurand values which can be measured and displayed with full scale sensitivity are four; and

display means for displaying digital numbers corresponding to the output from said analog-to-digital converter circuit means.

4,329,642

CARRIER AND TEST SOCKET FOR LEADLESS INTEGRATED CIRCUIT

Robert B. Luthi, San Jose, and Clair E. Williams, Sunnyvale, both of Calif., assignors to Siliconix, Incorporated, Santa Clara, Calif.

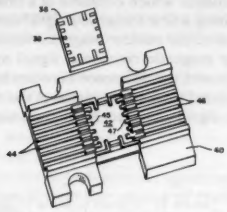
Filed Mar. 9, 1979, Ser. No. 18,869

Int. Cl.³ G01R *31/02;* H05K *1/12;* B65D *81/06*

U.S. Cl. 324—158 F **3 Claims**

1. A leadless integrated circuit carrier and test socket comprising a base, a circuit receiving cavity disposed in a central portion of said base, a plurality of electrically conductive leads disposed on a major surface of said base and affixed thereto, said body leads arranged to mate with contacts of test means, a cantilever portion of each of said leads projecting into said cavity, each of said cantilever portions including a contact area with the contact areas cooperatively arranged to mate with contacts on said integrated circuit means for retaining an integrated circuit in said cavity and in pressure contact with said cantilever portions of said leads, the top surface of said base having a raised portion, the bottom surface of said base having

a recessed portion whereby a plurality of carriers and sockets can be stacked with the raised portion of one carrier and socket



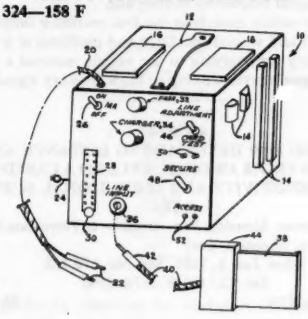
mating with the recessed portion of an adjacent carrier and socket.

4,329,643

PORTABLE CIRCUIT TESTING SYSTEM

Manfred H. Neumann, Michel Klinitz Weg 17, 100 Berlin 47; Günter H. Wallstab, Planufer 92E, 1000 Berlin 61; Lutz R. Heike, Kaiserin Augusta Allee 36, 1000 Berlin 10; Frank U. Zimmerman, Tacitusstr. 12A, 1000 Berlin 42, all of Fed. Rep. of Germany, and Lawrence A. Durante, Box 44, APO, N.Y. 09611

Filed Mar. 13, 1980, Ser. No. 129,859
Int. Cl.[3] G01R *31/02*; G08B *29/00*
U.S. Cl. 324—158 F **4 Claims**



1. In a security system having a master panel with an audio alarm and readout module subsystems, each module subsystem having indicator lights for visually indicating a tripping of the subsystem for alarm indication, and switches for setting or resetting the alarm subsystem, and a connector as a part thereof adapted to mate with a module mounting mating connector on said master panel,

the improvement comprising a test arrangement which allows for regular operation or testing and adjustment of a module at a position remote from said master panel, said test arrangement comprising

a card adapter including a connector configured to mate with a module mounting connector of said master panel and an extension cable having wires connected at one end with said card adapter connector and at the other end with a second connector,

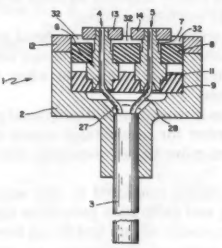
a test unit having a mounting connector configured to correspond to a mounting connector on said master panel for mounting a module to be tested, a third connector adapted to join with said second connector of said card adapter for transmitting any signal directed from said master panel to a module to be tested to allow for remote operation and testing of a module mounted in said test unit, a power supply, and switching means for selectively connecting said card adapter extension cable to a module to be tested for operation of said module by said master panel and for applying internally generated signals from said power supply to provide a test of said module.

4,329,644

ELECTRODE STRUCTURE FOR A HIGH TEMPERATURE CAPACITANCE PROBE FOR SENSING TURBINE SPEED

Zoltan L. Libertini, Stamford; Alan R. Duly, Huntington, and Steven D. White, North Haven, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Apr. 3, 1980, Ser. No. 137,072
Int. Cl.[3] G01P *3/483*; G01R *27/26, 1/06*
U.S. Cl. 324—160 **1 Claim**



1. A probe for sensing the passing of a rotor blade in the hot turbine section of a gas turbine engine comprising:

a housing constructed of high temperature resistant material having an open receptacle constructed therein;

an insulating member constructed of high temperature resistant insulating material secured in the receptacle of the housing and adapted to receive and position at least one pair of electrodes within the housing, said insulating member constructed to insulate the electrodes from the housing;

at least one pair of electrodes constructed of high temperature resistant material mounted in locked position within the insulating member and further comprising:

an electrode pin constructed to fit into the insulating member and being positioned thereby to extend outward from the housing;

an electrode tip secured to the outer extremity of the electrode pin and extending transverse thereto to form an electrode having a substantially T-shaped cross section, said electrode tip being entirely surrounded by an air gap thereby increasing the over surface path between the electrodes and between the electrodes and the housing;

a cable extending through the housing and containing a conductor connected to each electrode; and

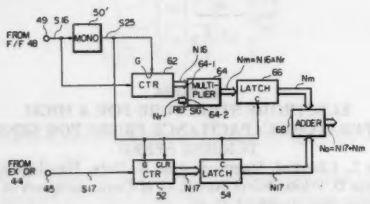
means to mount the probe in proximity to the turbine blades of the gas turbine engine in a position at which the electrodes extend into the turbine area sufficiently close to the turbine blades such that an electrical field applied to the electrodes will be altered by the passage of the turbine blades.

4,329,645

ROTATIONAL SPEED MEASURING SYSTEM HAVING A CIRCUIT FOR INCREASING THE ACCURACY THEREOF

Sadao Takase, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Tokyo, Japan

Filed Apr. 17, 1979, Ser. No. 30,955
Claims priority, application Japan, Jun. 13, 1978, 53-70312
Int. Cl.³ G01P *3/48, 3/54;* G01B *7/14*
U.S. Cl. 324—166 7 Claims



1. A rotational speed measuring system, comprising:

(a) a rotational member;

(b) sensor means fixedly disposed adjacent to the peripheral portion of said rotatable member;

(c) first means arranged on said peripheral portion of said rotatable member for causing said sensor means to generate a calibration pulse train signal when said rotatable member rotates;

(d) marker means arranged on said peripheral portion of said rotatable member for causing said sensor means to produce a marker pulse signal when said rotatable member rotates;

(e) an electric circuit connected to said sensor means for distinguishing said calibration pulse train signal produced in response to passage of said first means from said marker pulse signal produced in response to passage of said marker means;

(f) a monostable multivibrator responsive to said marker pulse signal to produce a pulse signal of a predetermined pulse width;

(g) a first counter responsive to said calibration pulse train signal and to said pulse signal from said monostable multivibrator for counting the number of said calibration pulses for said predetermined period of time;

(h) a second counter responsive to said marker pulse signal for producing an output signal indicative of the number of the marker pulses;

(i) a multiplier responsive to the output of said second counter for producing a signal indicative of a number which corresponds to the product of said number of said marker pulses and a predetermined number; and

(j) an adder responsive to the output signal of said first counter and said multiplier for producing a signal indicative of a number corresponding to the sum of the number of the calibration pulses indicated by said first counter output signal and the number corresponding to said product.

4,329,646

IMPULSE RESONANCE SPECTROMETER

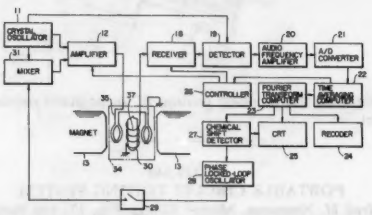
Munetaka Tsuda, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,404
Claims priority, application Japan, May 21, 1979, 54-61447
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—307 12 Claims

1. An impulse resonance spectrometer wherein high frequency energy in the shape of pulses is applied to a sample material located in a polarizing magnetic field, to detect a nuclear magnetic resonance signal from the sample material, said impulse resonance spectrometer comprising:

(1) a first oscillator which oscillates at a first high frequency for generating a first frequency signal corresponding to a main signal of the nuclear magnetic resonance signal,

(2) a nuclear magnetic resonance signal measuring device which measures the difference between frequencies of the main signal and a subsidiary signal of the nuclear magnetic resonance signal detected from the sample material by



applying the output of said first oscillator to the sample material;

(3) a second oscillator in the form of a phase-locked loop which oscillates to produce an output corresponding to the frequency signal from said nuclear magnetic resonance signal measuring device; and

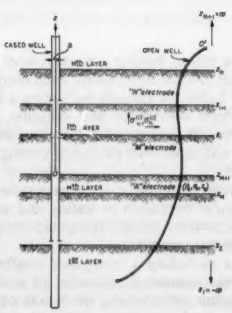
(4) a mixer which modulates the first oscillator output with the output of said second oscillator and oscillates at a second high frequency for applying to the sample material a second frequency signal corresponding to the subsidiary signal.

4,329,647

METHOD FOR DETERMINING DISTANCE AND DIRECTION FROM AN OPEN WELL TO A CASED WELL USING RESISTIVITY AND DIRECTIONAL SURVEY DATA

Robert Freedman, Houston, Tex., assignor to Petroleum Physics Corporation, Houston, Tex.

Filed Jun. 4, 1981, Ser. No. 270,383
Int. Cl.³ G01V *3/18, 3/00*
U.S. Cl. 324—323 18 Claims



1. A method for determining distances and directions from an open well to a cased well comprising

determining the resistivities and thicknesses of the earth strata penetrated by said wells by induction logs run in said open well or previously run in said cased well,

determining the actual trajectory in the earth of the open well by directionally surveying said well,

determining theoretically expected resistivity curves for long and short spaced electrode-type resistivity tools at

various depths in said open well for different assumed positions of the cased well relative to the open well from said earth strata resistivities and thicknesses determined by induction logs,

determining measured resistivity curves for long and short spaced electrode-type resistivity tools by logging said open well,

varying the assumed relative positions of the open and cased well by translation of said theoretically expected resistivity curves until the theoretically expected resistivity curve matches the measured resistivity curve in a least squares fit mathematical sense, and

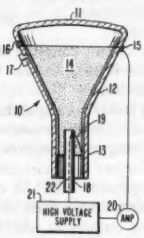
determining the distances of selected points in the open well to the cased well from the amount of translation of said theoretically expected resistivity curve required to produce said match of said theoretically expected and said measured resistivity curves.

4,329,648

METHOD OF CHECKING FOR ELECTRICAL FRIT BREAKDOWN IN KINESCOPES AND APPARATUS THEREFOR

Gerald M. Allaroyce, Avoca; Ronald N. Moskalczak, Jermyn, and Edward A. Gronka, W. Nanicoke, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,815
Int. Cl.³ G01R *31/024*
U.S. Cl. 324—404 **17 Claims**



1. A probe for checking for electrical frit breakdown in kinescopes having an internal conductive coating in a funnel portion and a neck portion comprising:

an elongated member cross-sectionally dimensioned to slip through said neck portion while remaining clear of said neck portion;

movable electrical contact means carried by said elongated member so that said contact means can be placed in the proximity of said conductive coating by inserting said elongated member into said neck portion; and

means for moving said electrical contact into electrical contact with said internal conductive coating.

4,329,649

ION SENSOR PROBE

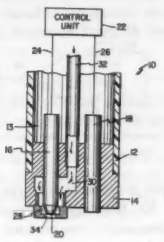
Kenneth D. Scoates, Pittsburgh, Pa., assignor to Gibbs & Hill, Inc., New York, N.Y.

Filed Dec. 12, 1979, Ser. No. 102,930
Int. Cl.³ G01N *27/42*
U.S. Cl. 324—438 **16 Claims**

1. A probe for monitoring the pH of a solution, comprising:

a. at least one sensor cell having an ion sensor at one end thereof;

b. housing means defining a chamber for supporting the sensor cell in the chamber, the housing means having an open end permitting entry and exit of at least a portion of the solution, the sensor cell being positioned within the chamber such that the ion sensor is capable of fluid communication with at least a portion of the solution passing through the open end; and



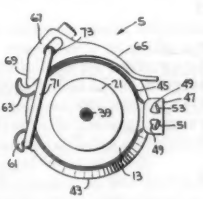
c. means for cleansing the one end of the sensor cell.

4,329,650

ULTRA-CLEAN CELL ASSEMBLY

Horace A. Teass, Jr., Armonk, N.Y., and Patrick F. McKernan, Middletown, N.J., assignors to McNab Incorporated, Mount Vernon, N.Y.

Filed Feb. 5, 1980, Ser. No. 119,042
Int. Cl.³ G01N *27/42*
U.S. Cl. 324—450 **8 Claims**



1. A conductivity cell assembly including, a combination, a piping fitting and a conductivity cell having a pair of electrodes, said piping fitting having an open end and said cell being in juxtaposition to said end and having an end disposed in operative position in engagement with the periphery of said open end of said piping fitting which houses a fluid to be tested and said electrodes projecting from said end of the cell into the fluid with said end of said conductivity cell being in contact with the test fluid, and external fastening means extending externally about said conductivity cell and said piping fitting and operable externally thereof for releasably maintaining said cell and said piping fitting together at their juxtaposed ends.

4,329,651

CHIRP FILTERS/SIGNALS

James M. Alsup, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1980, Ser. No. 138,640
Int. Cl.³ H03B *19/00*
U.S. Cl. 328—14 **7 Claims**

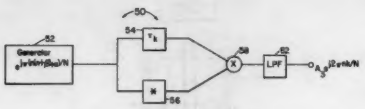
1. A synthesizer of discrete signals, comprising:

means for generating a chirp signal $e^{j\pi(n(n+\beta)+\alpha)/N}$, where $n=0, 1, 2, \ldots, M$, and β, α and N are constants;

means, having an input connected to the output of the chirp generating means, for delaying its input signal by a time delay τ_k, $k=0, 1, 2, \ldots, M$;

means, also having an input connected to the output of the chirp generating means, for converting the signal at its input into a signal which is the complex conjugate of its input signal;

means having as its two inputs the outputs of the delaying and the converting means, for multiplying its input signals; and



SECOND IMPROVED DISCRETE CHIRP SYNTHESIZER

means, whose input is connected to the output of the multiplying means, for filtering its input signal in order to remove high-frequency components of the input signal, the output signal being a complex sinusoidal frequency.

4,329,652

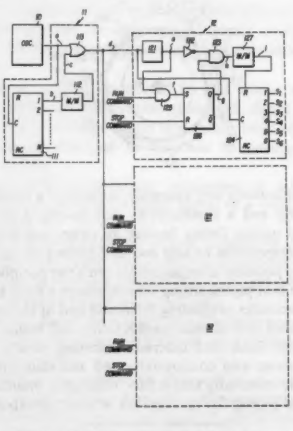
APPARATUS FOR SYNCHRONIZATION CONTROL OF A PLURALITY OF INVERTERS

Osamu Higa, and Nagataka Seki, both of Fuchu, Japan, assignors to Tokyo Shibaura Electric Company, Limited, Tokyo, Japan

Continuation of Ser. No. 762,279, Jan. 25, 1977, Pat. No. 4,171,517. This application Feb. 27, 1979, Ser. No. 15,638

Int. Cl.³ H03K *17/00*

U.S. Cl. 328—72 **2 Claims**



1. An apparatus for the synchronization control of a plurality of inverters, comprising:

a reference pulse oscillator;

synchronizing signal generating means responsive to the output of the reference pulse oscillator for generating distinct synchronizing signals having different widths from that of the output of the reference pulse oscillator, for adding said generated synchronizing signals to the output of the reference pulse oscillator, and for supplying an output corresponding to the sum thereof; and,

a plurality of gate control means responsive to the output of the synchronizing signal generator for controlling the gates of said inverters, each gate control means coupled to a respective inverter and including means for detecting the synchronizing signals from the output of said synchronizing signal generating means and means for synchronizing the gates of said inverters by means of said detected synchronizing signals.

4,329,653

CIRCUIT ARRANGEMENT FOR STORING THE PHASE OF AN A-C VOLTAGE

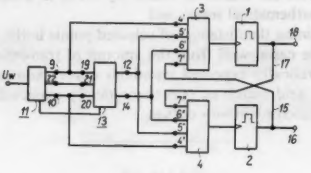
Walter Offermanns, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 125,399

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1979, 2907682

Int. Cl.³ H03L *7/00;* **H03B** *1/04*

U.S. Cl. 328—155 **8 Claims**



1. A circuit arrangement for storing the phase of an a-c voltage, comprising:

(a) one monostable multivibrator which provides at its output a square wave pulse train corresponding to the positive half waves of the a-c voltage;

(b) a further monostable multivibrator which provides at its output a further squarewave pulse train corresponding to the negative half waves of the a-c voltage;

(c) one logic circuit coupling the output of said further monostable multivibrator to the input of said one monostable multivibrator;

(d) a further logic circuit coupling the output of said one monostable multivibrator to the input of said further monostable multivibrator;

(e) means coupling pulses corresponding to the negative half waves of the a-c voltage to said one logic circuit and pulses corresponding to the negative half waves of the a-c voltage to said further logic circuit; and

(f) a control arrangement which is controlled by the a-c voltage having outputs coupled to said logic circuits to control said logic circuits to pass said half wave pulses during normal operation and, in the event of a phase change to pass squarewave pulses at the outputs of said monostable multivibrators to the inputs of said monostable multivibrators.

4,329,654

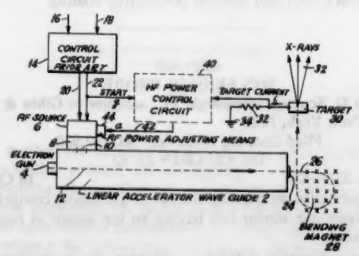
PARTICLE ACCELERATOR

Jerry E. Chamberlain, Pittsburg, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Apr. 17, 1980, Ser. No. 141,111

Int. Cl.³ H05H *9/00*

U.S. Cl. 328—233 **12 Claims**



1. A particle accelerator comprising:

(a) accelerator guide means for accelerating particles, said

guide means having an input for receiving particles and an output for emitting pulses of high energy particles;

(b) injection means for injecting particles into the input of said guide means;

(c) a pulsed source of high frequency power, said source having power adjusting means;

(d) means for introducing said high frequency power from said source into said guide means for energy exchange with and for acceleration of said particles to obtain said high energy particle pulses at the output of said accelerator guide means;

(e) a magnet structure positioned at the output of said accelerator guide means for bending the path of said particles and for forming a beam of said particles passing therethrough, thereby acting as an energy filter for said particles;

(f) means for measuring said beam of particle pulses emitted from said magnet structure;

(g) high frequency power control means connected to said power adjusting means, said high frequency power control means including:

(g1) means for determining the pulse form of said particle pulses and for supplying an adjusting signal in dependence on the deviation of each particle pulse form from an optimum pulse form, said signal supplying means being connected to said measuring means; and

(g2) means for connecting said adjusting signal means to said power adjusting means to change the high frequency power of said source, thereby adjusting the form of the measured particle pulses towards the optimum pulse form and maintaining a constant energy distribution in said beam of accelerated particles.

4,329,655
ADAPTIVE EQUALIZATION SYSTEM FOR NONLINEARITIES

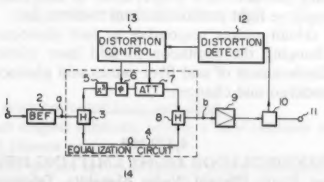
Toshio Nojima, Yokosuka, and Satoshi Ohyama, Yunotani, both of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo, Japan

Filed Jan. 31, 1980, Ser. No. 117,282

Claims priority, application Japan, Feb. 13, 1979, 54/14358; Dec. 14, 1979, 54/161449

Int. Cl.³ H03F *1/33*

U.S. Cl. 330—149 **9 Claims**



1. An adaptive equalization system for nonlinearities comprising,

(a) an input terminal receiving an input signal, an output terminal providing an equalized output signal, and a circuit to be equalized inserted between the input terminal and the output terminal,

(b) an equalization circuit connected in series with that circuit to be equalized, having a series circuit with a distortion generator for providing the high order distortion, a variable phase shifter for shifting the phase of the output signal of said distortion generator and a variable attenuator for adjusting the amplitude of the output signal of the distortion generator, and a delay means connected parallel to that series circuit so that the delay time in that delay means is equal to the delay time in said series circuit,

(c) a distortion detector connected to the output terminal of the adaptive equalization system for detecting the noise level in the predetermined narrow frequency band, and

(d) a distortion control circuit connected to the output of said distortion detector for controlling said variable phase shifter and said variable attenuator so that the distortion detected by said distortion detector becomes minimum.

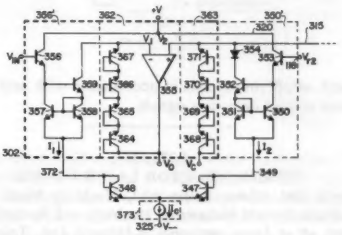
4,329,656
HIGH-SPEED VOLTAGE SUBTRACTOR

Pern Shaw, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 953,307, Oct. 20, 1978, abandoned, which is a continuation of Ser. No. 764,499, Jan. 31, 1977, abandoned. This application Oct. 9, 1979, Ser. No. 82,458

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—257 **4 Claims**



1. A high-speed subtractor circuit comprising:

amplifier means responsive to an analog input signal and to a first reference voltage for producing an output voltage so that it is proportional to the difference between said analog input signal and said reference voltage;

first means responsive to a control signal for controllably electrically coupling said first reference voltage to a first input of said amplifier means;

second means responsive to said analog input signal for electrically coupling said analog input signal to a second input of said amplifier means;

feedback means coupled between the output of said amplifier means and said second input of said amplifier means for effecting said producing of said proportionality of said output voltage;

third means coupled between a constant reference voltage and said first reference voltage for effecting said producing of said proportionality of said output voltage.

4,329,657
AMPLIFIER WITH POWER SUPPLY SWITCHING

Shingo Kamiya, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 14, 1980, Ser. No. 196,871

Claims priority, application Japan, Oct. 16, 1979, 54-133387

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—297 **15 Claims**

1. An amplifier with power supply switching, comprising:

amplifying means for amplifying an input signal to said amplifier;

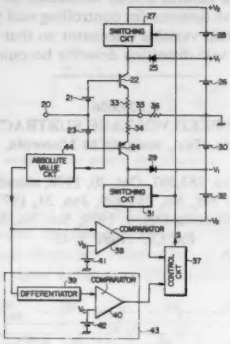
power supply means selectively supplying high and low voltages to said amplifying means;

first detecting means for detecting a level of a signal corresponding to said input signal and generating a first detection signal when said level is in a certain relationship with a first reference signal;

second detecting means for detecting a rise time of said signal corresponding to said input signal and generating a second detection signal when said rise time is in a certain relationship with a second reference signal; and

switching circuit means being responsive to either of said

first and second detection signals for switching levels of the voltages supplied from said power supply means to



said amplifying means in accordance with said first and said second detection signals.

4,329,658

SEMICONDUCTOR LASER DEVICE

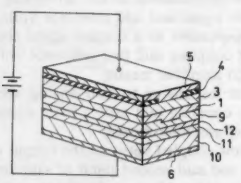
Atsutoshi Doi, Ohme; Kunio Aiki, Hachioji; Naoki Chinone, Hachioji; Satoshi Nakamura, Hachioji, and Ryoichi Ito, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1979, Ser. No. 51,144

Claims priority, application Japan, Jun. 30, 1978, 53-78674

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—45 **11 Claims**



1. A semiconductor laser device having a semiconductor material assembly for generating laser beams comprising:

a first semiconductor layer providing an active region formed between lateral regions of said first layer adjacent to said active region thereof;

a substrate for crystal growth, said substrate having on a surface thereof a second semiconductor region on which the first layer has been formed directly by crystal growth so that said first layer as in direct contact with said second semiconductor region;

a third semiconductor layer formed on the first layer, the second region and the third layer having a smaller refractive index than the first layer and having a broader band gap than the first layer;

a first electrode on the upper surface of said assembly;

a second electrode on the lower surface of the said assembly; and

means for providing optical feedback so as to generate said laser beams,

wherein, in a cross-section of said semiconductor material assembly perpendicular to the direction of said laser beams, the first layer is thicker at the said active region than at said lateral portions of the first layer and projects at said active region into a stripe-shaped recess formed in said second region in a direction parallel to the direction of said laser beams so that the effective refractive index of said first layer to said laser beams varies stepwise across the assembly in a direction perpendicular to the direction of said laser beams.

4,329,659

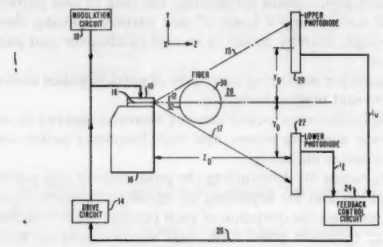
FEEDBACK CONTROL OF LASERS IN FIBER OPTIC SYSTEMS

Fang-Shang Chen, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1979, Ser. No. 107,511

Int. Cl.³ H01S *3/13*

U.S. Cl. 372/29 **7 Claims**



1. A control arrangement comprising:

(a) a laser (**10**) for generating a beam of radiation along a propagation axis (**12**);

(b) an optical fiber (**28**) oriented so as to couple a major portion (**13**) of said beam into said fiber; and

(c) feedback means responsive to said beam for changing the excitation to said laser so as to maintain essentially constant the average power coupled into said fiber;

characterized in that the axis of said fiber is oriented transverse to said propagation axis, whereby a displacement of said fiber in a direction transverse both to said propagation axis and to the fiber axis changes the coupling of said laser beam into said fiber, and said feedback means includes

(i) a pair of photodetectors, each for generating a different photocurrent proportional to a respective light portion incident thereon, said photodetectors positioned on opposite sides of the plane formed by said axes so that said displacement of the fiber changes the respective said photocurrents proportional to said change in respective light portion incident thereon, and

(ii) circuit means responsive to said photocurrents for changing the excitation to said laser whenever said displacement of said fiber causes said photocurrents to undergo said changes.

4,329,660

SEMICONDUCTOR LIGHT EMITTING DEVICE

Mitsuhiro Yano; Hiroshi Nishi; Masahito Takusagawa, and Yorimitsu Nishitani, all of Kawasaki, Japan, assignors to Fijitsu Limited, Kawasaki, Japan

Filed Feb. 11, 1980, Ser. No. 120,095

Claims priority, application Japan, Feb. 13, 1979, 54-15617; Mar. 16, 1979, 54-31356; Mar. 16, 1979, 54-31357

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—46 **17 Claims**

1. A semiconductor light emitting device comprising,

a semiconductor substrate,

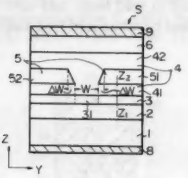
a first clad layer of semiconductor formed on the semiconductor substrate,

an active layer of semiconductor formed on the first clad layer,

a second clad layer of semiconductor formed on the active layer,

electrodes arranged on the second clad layer and on the bottom surface of the semiconductor substrate, respectively, and

at least one buried layer of semiconductor buried in at least one of said clad layers, each buried layer having a conductivity type opposite to the conductivity type of the clad



layer in which it is buried and an index of refraction different from the index of refraction of the clad layer in which it is buried, each said buried layer having a configuration for determining a light emitting region of said active layer.

4,329,661

TERRACED SUBSTRATE SEMICONDUCTOR LASER

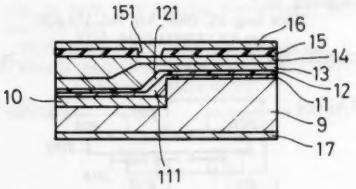
Takashi Sugino, Takatsuki; Kunio Ito, Uji; Masaru Wada, Takatsuki, and Hirokazu Shimizu, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 7, 1980, Ser. No. 128,313

Claims priority, application Japan, Mar. 9, 1979, 54-28116; Apr. 20, 1979, 54-49518

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—46 **6 Claims**



1. In a semiconductor laser including

a terrace shaped substrate having a step between a thicker and a thinner part,

epitaxially grown layers including a first clad layer and an active layer, said active layer being disposed on said first clad layer and having an upper norizontal part formed above said thicker part of said substrate and a lower horizontal part formed above said thinner part of said substrate and a strip shaped oblique active region formed between said upper and said lower horizontal parts, and

an electrode formed on said epitaxially grown layers at least above said oblique active region,

wherein the improvement comprises:

a current limiting layer for preventing a current from flowing therethrough, said current limiting layer being disposed between said first clad layer and said thinner part of the substrate in a manner to cover said thinner part by extending to the lower end of the step,

the thickness of said current limiting layer being less than the height of said step thereby allowing said step part of the substrate to contact the lowest layer of said epitaxially grown layers.

4,329,662

SILENT DISCHARGE GAS LASER

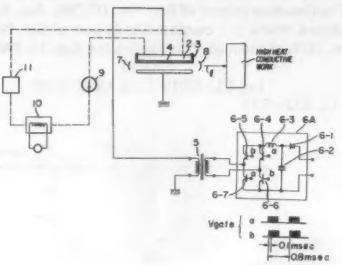
Shigenori Yagi; Shuji Ogawa, and Norikazu Tabata, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1980, Ser. No. 132,157

Claims priority, application Japan, Mar. 20, 1979, 54/32568

Int. Cl.³ H01S *3/97*

U.S. Cl. 372—38 **6 Claims**



1. In a silent discharge gas laser which comprises a high voltage electrode and a low voltage electrode, each electrode having a discharge surface, at least one of said discharge surfaces of said electrodes being covered with a dielectric layer and cooled, the improvement comprising:

a power input for supplying high frequency, high voltage AC power having a period T;

a first circuit means for receiving said power input and applying an output voltage between said electrodes to excite a laser gas, said first circuit means comprising switching means for alternating said output signal between a first voltage having a substantially zero peak value and a second voltage having a high peak value, wherein said first voltage does not start a discharge between said electrodes and has a period greater than 4 times T and said second voltage does start a discharge between said electrodes and has a period greater than 4 times T.

4,329,663

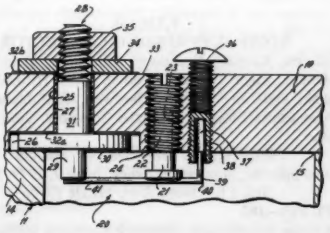
BACK PLATE MOUNTED LUMPED ELEMENT MICROWAVE OSCILLATOR

Alexander B. Bereskin, 452 Riddle Rd., Cincinnati, Ohio 45220

Filed Mar. 24, 1980, Ser. No. 132,834

Int. Cl.³ H03B *9/12*

U.S. Cl. 331—96 **10 Claims**



1. In a lumped element microwave oscillator mounted on the back plate secured to an end of a wave guide which is coupled to a load, the oscillator including a two-terminal solid-state device which exhibits negative resistance in the microwave range, the improvement comprising:

a capacitive means mounted on the back plate; and

a loop mounted on the back plate, the loop and the capaci-

tive means comprising a resonant circuit connected to the two-terminal solid-state device;

the angular orientation of the loop with respect to the plane of the E field in the wave guide being chosen for the coupling desired between the oscillator and the load.

4,329,664

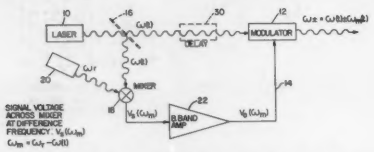
GENERATION OF STABLE FREQUENCY RADIATION AT AN OPTICAL FREQUENCY

Ali Javan, 12 Hawthorne St., Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 157,708, Jun. 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 939,993, Sep. 6, 1978, abandoned. This application Aug. 14, 1980, Ser. No. 178,090

Int. Cl.³ H01S *3/10*; G01C *3/08*

U.S. Cl. 332—7.51 **9 Claims**



1. A system for generating optical radiation employing a power laser that produces optical radiation at a frequency, ω, that can fluctuate over a short interval characterized by apparatus for producing from said radiation at frequency ω radiation of more stable frequency, said apparatus comprising

(a) modulation signal generating means responsive to said optical radiation from said power laser, said modulation signal generating means including

i. a reference source for optical radiation having relatively lower power and higher frequency-stability than that of said power laser,

ii. a non-linear mixing element arranged to mix inputs of radiation from said power laser and said reference source, said mixing element characterized by a high speed of response sufficient to produce a difference signal at a frequency, ω_m, corresponding to the instantaneous differences in frequency of said inputs

(b) and an electro-optical modulator for generating the desired stable optical radiation,

i. said modulator having as inputs said fluctuating optical radiation of frequency ω from said power laser and said modulation signal of frequency ω_m,

ii. and said modulator having as an output an optical sideband of said power laser frequency ω that is free of fluctuations that are present in said power laser frequency ω.

4,329,665

NOISE SUPPRESSING CONNECTOR

Senji Kawai, Komaki; Yoshihumi Morimoto, Aichi; Masayuki Watanabe, Aichi; Hiroshi Yamaya, Aichi; Hitoshi Kurohata, Komaki, and Joji Nakamura, Inazawa, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed May 5, 1980, Ser. No. 146,425

Claims priority, application Japan, May 9, 1979, 54-57326

Int. Cl.³ H03H *7/01*; H01R *13/66*

U.S. Cl. 333—182 **22 Claims**

1. A noise suppressing connector having at least one section which establishes a signal connection, said section comprising:

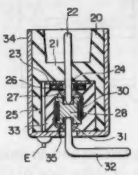
(a) an insulative housing having a partition therein, said housing having at least one bore defined by the inner wall of said housing and said partition;

(b) a shielding casing for receiving said housing;

(c) a first conductive contact pin embedded in said partition, said first contact pin extending outwardly from said partition in both directions substantially perpendicular to said partition so that one end of said first contact pin projects into said bore;

(d) a second conductive contact pin extending outwardly from said bore;

(e) a filter including at least a capacitor and a coil, said filter being received in said bore, and said filter being electrically interposed between said first and second contact pins



so that said first and second contact pins and said filter constitute a signal transmission line;

(f) a conductive plate having a through-hole therein, said conductive plate being disposed in said bore to enable a portion of said signal transmission line to pass through said through-hole; and

(g) an insulative filling disposed in said bore.

4,329,666

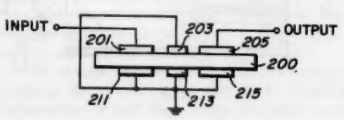
TWO-POLE MONOLITHIC CRYSTAL FILTER

Aristotelis S. Arvanitis, Addison, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 11, 1980, Ser. No. 176,630

Int. Cl.³ H03H *9/56, 9/15*

U.S. Cl. 333—191 **26 Claims**



1. An improved monolithic crystal filter having a predetermined passband and passband center frequency, comprising:

a piezoelectric substrate having first and second flat, parallel surfaces, the substrate having a predetermined fundamental frequency that is greater than the passband center frequency;

first electrode means including a pair of electrodes opposingly disposed on the surfaces of the substrate, the first electrode means being adapted to resonate substantially at the passband center frequency;

second electrode means including a pair of electrodes opposingly disposed on the surfaces of the substrate at a predetermined distance from the first electrode means, the second electrode means being adapted to resonate substantially at the passband center frequency;

strip electrode means including a pair of electrodes opposingly disposed on the surfaces of the substrate between the first electrode means and the second electrode means, the strip electrode means having a resonating frequency greater than the passband center frequency and further being electrically grounded.

4,329,667

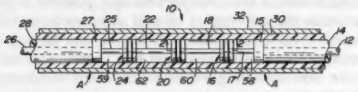
COAXIAL CABLE LOW FREQUENCY BAND-PASS FILTER

Robert H. Schafer, Perkasie, Pa., assignor to UTI Corporation, Collegeville, Pa.

Continuation-in-part of Ser. No. 92,167, Nov. 7, 1979, Pat. No. 4,266,207. This application Jan. 5, 1981, Ser. No. 222,227

Int. Cl.³ H01P 1/202, 3/06, 11/00

U.S. Cl. 333—206 7 Claims



1. A coaxial cable comprising at least two center conductors aligned with one another, at least one low frequency band-pass filter coupling element between said center conductors, said element being a laminate of dielectric material having a conductive layer on opposite faces, each layer being bonded to a mass whose dominant equivalent circuit is a shunt capacitor, each conductor having one end metallurgically joined to a separate one of said masses, a sleeve of dielectric material surrounding and contacting the outer periphery of said laminent, and a monolithic jacket of electrically conductive material surrounding said tube and exerting radially inward compressive forces on the entire circumference of said tube to eliminate any air gap therebetween.

4,329,668

LEAKAGE CURRENT CIRCUIT BREAKER RESPONSIVE TO DIRECT-CURRENT LEAKAGE CURRENTS OF BOTH POLARITIES

Nicolas Gath, 15, rue Jos. Tockert, Luxembourg-Hollerich, Luxembourg

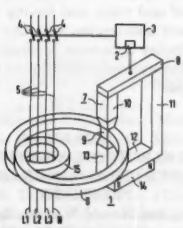
PCT No. PCT/EP78/00013, § 371 Date Apr. 26, 1979, § 102(e) Date Apr. 26, 1979, PCT Pub. No. WO79/00127, PCT Pub. Date Mar. 22, 1979

PCT Filed Aug. 28, 1978, Ser. No. 141,082

Claims priority, application Luxembourg, Sep. 2, 1977, 78075

Int. Cl.³ H01H 83/02

U.S. Cl. 335—18 8 Claims



1. Leakage current circuit breaker having operating current-carrying conductor interlinked with a core, whose magnetic induction flux effects the response of a triggering device in the case of leakage, in which an armature of the triggering device drops away from the magnetic system of the triggering device at the superposition of a permanent magnetic field by a magnetic field effected by the leakage current, and in which the core encompasses the operating current-carrying conductors in a plurality of windings, and wherein the core magnetizable by the leakage current is a component mechanically interconnected with the induction flux conductor of the triggering device, characterized in that the core (6) crosses the induction flux conductors (7) of the triggering device (2) in a single path passage through the core.

4,329,669

CIRCUIT BREAKER WITH AUXILIARY TRIPPING UNIT

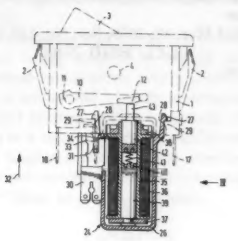
Fritz Krasser, and Oswald Onderka, both of Altdorf, Fed. Rep. of Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,340

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928277

Int. Cl.³ H01H 83/00, 73/48

U.S. Cl. 335—20 8 Claims



1. In a two-pole excess-current protective circuit breaker including contacts having open and closed positions; manually engageable means operatively connected with said contacts for manually opening and closing the contacts; latching means having a normal position in which operation of said manually engageable means remains unimpeded; said latching means having a tripped position for opening and maintaining open said contacts irrespective of the position of said manually engageable means and bimetal means operatively connected with said latching means; said bimetal means having a normal state allowing said latching means to assume said normal position and a heat-caused deformed state in which said bimetal means displaces said latching means into, and maintains said latching means in said tripped position; said circuit breaker further including a first housing accommodating said movable contacts, said manually engageable means, said latching means and said bimetal means; the improvement comprising in combination:

(a) a pivotally supported tripping lever having first and second legs and forming part of said latching means; said bimetal means being operatively connected with said first leg;

(b) an electromagnetically operated auxiliary tripping unit including

(1) a second housing;

(2) a solenoid accommodated in said second housing and having an energized state and a de-energized state;

(3) a plunger displaceably supported in said second housing and cooperating with said first leg of said tripping lever; said plunger having an advanced position in which the plunger pushes said tripping lever for setting said latching means into the tripping position; said plunger further having a withdrawn position in which the plunger allows said tripping lever to move for setting said latching means into the normal position; said solenoid, when in said energized state, moving said plunger into and maintaining said plunger in one of the plunger positions;

(4) a spring means accommodated in said second housing and being operatively connected to said plunger for moving said plunger into, and maintaining said plunger in the other of the plunger positions when said solenoid is in a de-energized state;

(c) mounting means for supporting said second housing on said first housing externally thereof;

(d) electric connecting means carried on said first and second housings; said electric connecting means being cou-

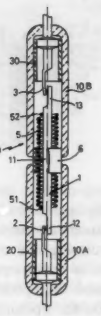
pled to one another for electrically connecting said solenoid to the circuit breaker; and

(e) means defining an opening in said first housing; said opening being in alignment with said latching means for providing passage of said plunger into said first housing for cooperation with said first leg of said tripping lever.

4,329,670
MERCURY REED SWITCH

Romain L. F. Bollen, Hasselt, and Jean-Marie M. G. Ponsard, Alken, both of Belgium, assignors to C. P. Clare International N.V., Belgium

Filed Mar. 12, 1980, Ser. No. 129,743
Int. Cl.³ H01H *29/00*
U.S. Cl. 335—56 8 Claims



1. A mercury reed switch comprising:

a capsule;

a pair of stationary contacts included inside said capsule;

a helicoidal spring extending axially inside said capsule;

a cylindrical annular electrode extending around and being attached to the central portion of said helicoidal spring, said annular electrode being fixedly positioned inside said capsule;

a movable armature comprised of a beam of magnetic material extending axially inside said helicoidal spring and being suspended to the ends of said helicoidal spring at two points symmetrically situated with respect to the transversal axis of said beam, the beam having a pair of pole ends which project beyond the helicoidal spring for alternately contacting a respective of said stationary contacts when the armature is pivoting; and

a film of mercury wetting the surface of said armature, the helicoidal spring, the inner surface of said annular electrode and the surface of said stationary contacts.

4,329,671
ALIGNMENT-INSENSITIVE SELF-CONVERGING IN-LINE COLOR DISPLAY

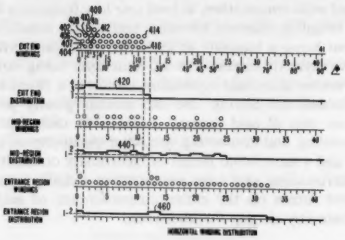
Josef Gross, Princeton, and William H. Barkow, Pennsauken, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 70,311, Aug. 27, 1979, abandoned. This application Apr. 13, 1981, Ser. No. 253,292
Int. Cl.³ H01J *29/70*
U.S. Cl. 335—213 2 Claims

1. A color television display apparatus, comprising:

a kinescope including an electron gun assembly for producing three in-line electron beams; and

a deflection yoke mounted upon said kinescope, said yoke including entrance and exit ends and also including horizontal deflection conductors in a distribution about said kinescope, said distribution of horizontal deflection conductors being described in a quadrant by horizontal fundamental Fourier coefficients normalized to the quantity of said horizontal deflection conductors in said quadrant, which normalized horizontal fundamental Fourier coefficients increase in value from said entrance end to reach a maximum value near said exit end of said yoke, said distribution of said horizontal conductors also being described in said quadrant by horizontal third-harmonic Fourier coefficients normalized to said horizontal fundamental coefficients at each longitudinal position at which said horizontal third-harmonic coefficients are established, said horizontal third-harmonic coefficients having a negative value near the entrance-end of said yoke, and having a value which becomes increasingly positive at positions towards the mid region of said yoke so as to take on a positive value near said mid region, and having a maximum positive value near said exit region; said deflection yoke also including vertical deflection conductors in a distribution about said kinescope, said vertical distribution being described in a quadrant by vertical fundamental Fourier coefficients normalized to the quantity of said



vertical conductors in said quadrant, which normalized vertical fundamental Fourier coefficients decrease in value from said entrance to said exit regions to reach a minimum value near said exit end of said yoke, said distribution of said vertical conductors also being described in said quadrant by vertical third-harmonic Fourier coefficients normalized to the value taken by said vertical fundamental Fourier coefficient at each longitudinal position at which said vertical third-harmonic Fourier coefficients are established, said vertical third-harmonic Fourier coefficients having values which are negative near said entrance-region of said yoke, and which values take on increasingly more positive values at positions toward said mid region of said yoke, and having a maximum positive value near said exit region, whereby the convergence of said color display apparatus is rendered substantially insensitive to the transverse position of said yoke relative to said kinescope.

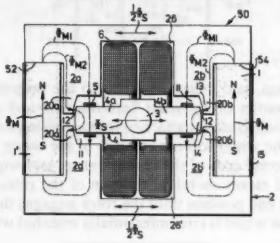
4,329,672
POLARIZED ELECTROMAGNETIC DRIVE FOR A LIMITED OPERATING RANGE OF A CONTROL ELEMENT

Heinz Stahl, Olpe, and Harald Wagner, Kreuztal, both of Fed. Rep. of Germany, assignors to Elektro-Mechanik GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 872,382, Jan. 26, 1978, abandoned. This application Nov. 20, 1979, Ser. No. 96,248
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703788; Jan. 29, 1977, 7702630[U]
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—229 2 Claims

1. A polarized electromagnetic drive preferably for actuating a turning servo valve, comprising an electromagnetic field iron core having a central open area and a coil receiving recess defined in said core on each side of said open area, a rotatable armature drive shaft located in the open area of said core for rotation about an axis of rotation, an armature affixed to said drive shaft for rotation therewith having a pair of diametrically opposed armature portions radially extending relative to the

axis of rotation with inner ends affixed to said shaft and outer ends extending outwardly from said shaft on respective opposite sides thereof, an actuating coil disposed in said coil receiving recess, said core having a leg portion spaced away from each side of each arm portion by an amount to define a large air gap between each side of each arm portion and each leg portion of said core, each leg portion having an end part extending outwardly from the associated leg portion and alongside the outer ends of said armature arm portions and being radially spaced relative to the axis of rotation from said outer ends by an amount to define a small air gap between each end part and the associated outer ends of said armature arm portions, said core having end pieces extending outwardly beyond each leg portion on each side of said leg portions and having a permanent magnet receiving recess defined therebetween, a permanent magnet in the permanent magnet receiving recess op-



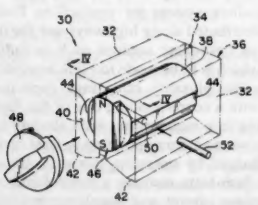
posed to and spaced from each end of each arm portion, each end part being located intermediate a respective permanent magnet and one of said outer ends of said armature arm portions, the large and small air gaps formed between said armature and said core being such that force components of the large and small air gaps result in a total force having a range of linearity which is greater than the range of linearity of the individual force components, a lever arm affixed to said shaft, and spring means for biasing said lever arm to a centering position, said lever arm including an arm portion extending outwardly from each side of said shaft, said spring means including first and second springs biased against each side of each portion of said lever arm, screw means associated with at least one of said springs for varying the tension on said springs for varying the positioning of the center position of said lever arm.

4,329,673

SWITCHABLE PERMANENT MAGNET HOLDING DEVICE

Mamoru Uchikune; Kiyoshi Yanagisawa; Mutsukazu Tagami, all of Ueda; Taketo Shimizu, Nagano; Kunio Horiuchi, and Hiroo Sakaguchi, both of Ueda, all of Japan, assignors to Kanetsu Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Jul. 25, 1980, Ser. No. 172,233
Claims priority, application Japan, Aug. 12, 1979, 54-102421
Int. Cl.³ H01F *7/20*
U.S. Cl. 335—288 **5 Claims**



1. A switchable permanent magnet holding device compris-

ing; a magnetic circuit block consisting of a pair of magnetic pole members respectively having a magnetism acting surface, and a non-magnetic plate disposed between said pair of magnetic pole members, said magnetic circuit block being provided with a bore having a circular cross section and running in parallel to the non-magnetic plate;

a permanent magnet disposed in said bore rotatably about the central axis of said bore and adapted to be switched between a position in which said magnetism acting surfaces of said block become non-exciting and a position in which said magnetism acting surfaces thereof become exciting; and,

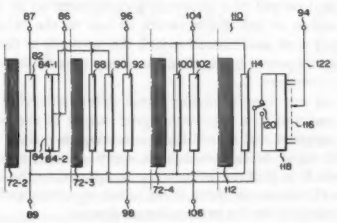
a stopper for impeding rotation of the permanent magnet, said stopper being adapted to engage said permanent magnet rotated to a position over a predetermined angle of rotation at which said magnetism acting surfaces of said block become exciting and said magnetic circuit block is maintained in a state of magnetic equilibrium, when said permanent magnet is turned in one direction, in order to switch the non-excited state of the magnetism acting surface of said block to the exciting state.

4,329,674

HIGH VOLTAGE TRANSFORMER FOR AC-DC CONVERTER

Tadayasu Hamano, Yamato, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 5, 1980, Ser. No. 184,263
Claims priority, application Japan, Sep. 10, 1979, 54-115253
Int. Cl.³ H01F *21/12, 27/28*
U.S. Cl. 336—92 **10 Claims**



1. A transformer unit for an AC-DC converter comprising:

a first core leg;

a first winding unit which is mounted on said first core leg and which includes a first primary winding and a first coupling winding electromagnetically coupled to said first primary winding;

a second core leg;

a second winding unit which is mounted on said second core leg and which includes a second primary winding connected in series with said first primary winding, a second coupling winding connected in parallel with said first coupling winding and electromagnetically coupled to said second primary winding, and a first secondary winding electromagnetically coupled to said second primary and coupling windings;

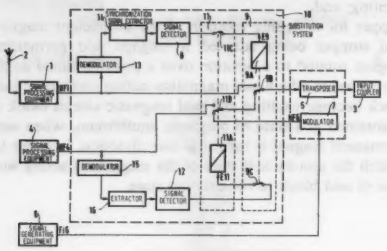
a third core leg; and

a third winding unit which is mounted on said third core leg and which includes a third coupling winding connected parallel with said first coupling winding, and a second secondary winding electromagnetically coupled to said third coupling winding.

4,329,675
SYSTEM FOR AUTOMATICALLY SUBSTITUTING TELEVISION SIGNALS AT A HEAD STATION FOR A CABLE NETWORK

Erick Van Hulle, Waterloo, Belgium, assignor to Societe Anonyme dite: Visiodis, Aubervilliers, France

Filed Sep. 23, 1980, Ser. No. 192,117
Claims priority, application France, Jul. 18, 1980, 80 15910
Int. Cl.³ H04N *5/22, 7/10*
U.S. Cl. 358—86 **2 Claims**



1. A system for automatically substituting transmissions at a station for applying television signals to a cable network, said station being equipped with at least one signal processing equipment of the broadcast receiver type or of the recorder type over which the distribution station has no control and having at least one television signal generating equipment controlled by the station, said substitution system including:

at least one switch having its output connected to the cable network and means for connecting two mutually exclusive inputs to the cable network and means for connecting two mutually exclusive inputs to the television signal output of a processing equipment and to the television signal output of a generating equipment so as to be in a position to link the network to one or the other of said equipment and biassed to link the network to the generating equipment in the absence of any specific instruction to the contrary;

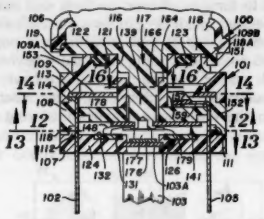
at least one synchronizing signal detector having its input connected to a television signal output of the processing equipment and means for connecting its output to a control input of said switch to apply an instruction to the switch to link the generating equipment to the cable network whenever there is no video synchronization signal coming from the processing equipment.

4,329,676
POTENTIOMETER

Gerald H. McDonald, Blaine, and Donald R. Hagen, Brooklyn Center, both of Minn., assignors to Resistance Technology, Inc., Roseville, Minn.

Filed Jan. 10, 1980, Ser. No. 110,802
Int. Cl.³ H01C *10/50*
U.S. Cl. 338—198 **46 Claims**

1. A potentiometer comprising: housing means having a chamber; a rotor having a stem rotatably assembled on the housing means, said stem extending into the chamber and said rotor having a portion extending outside of the chamber and housing means for manual manipulation to rotate the stem; an electrical wiper located on the stem, said wiper having a contact portion; a C-shaped resistive strip mounted on the housing means in the chamber, said strip having a first end and a second end with variable electrical resistance means between the first end and the second end; first terminal means electrically connected to the wiper; second terminal means electrically connected to the resistive strip; said wiper having contact means in engagement with the resistive strip and rotatable with the rotor stem from the first end of the resistive strip to the second end of the resistive strip whereby the resistance between the first terminal means and the second terminal means is varied; annular resilient means cooperating with the housing means and rotor for continuous friction braking said rotor; and means attached to the housing means and engageable with the rotor for limiting rotation of the rotor to allow the contact portion to move between the first end and second end of the

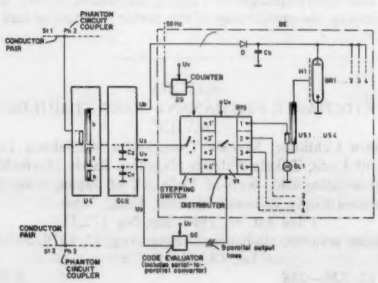


resistive strip, said means attached to the housing means for limiting rotation of the rotor between first and second positions, and second means attached to the housing means engageable with the wiper to limit rotation of the wiper between the first and second ends of the resistive strip, said wiper engaging said second means on initial rotation of the rotor to hold the wiper in an end position until the rotor engages the first means whereby the wiper is circumferentially oriented with the rotor.

4,329,677
SIGNAL-LIGHT SYSTEMS, ESPECIALLY FOR A SERIES OF EMERGENCY-PHONE STATIONS DISTRIBUTED ALONG THE LENGTH OF A HIGHWAY, OR THE LIKE

Georg Märkl, Nuremberg, Fed. Rep. of Germany, assignor to Te Ka de Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 55,005
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2830064
Int. Cl.³ G08B *5/00;* **H05B** *41/00*
U.S. Cl. 340—84 **14 Claims**



1. A signalling system for controlling flash-lamp stations which are distributed along highways and the like, comprising: a plurality of flash-lamp stations each including at least one flash lamp which is to be made to blink according to a blinking schedule; a like plurality of storage capacitor means, each associated with a corresponding one of the flash-lamp stations and operating in a manner that each storage capacitor means provides power to a corresponding at least one flash lamp and can be recharged by operating power; a transmission circuit linking the flash-lamp stations; a control station connected to the transmission circuit and supplying operating power and control signals thereto, whereby all flash lamps are powered and made to blink according to the blinking schedule, the

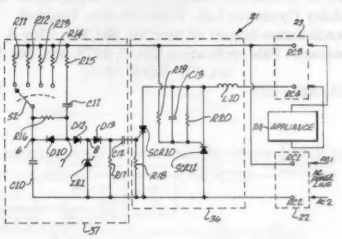
central station operating in a manner that the operating power has a greater magnitude than has the control signals; and a timer establishing the blinking schedule in a manner that recharging of the storage capacitor means and blinking of flash lamps takes place according to a predetermined interrelationship.

4,329,678

METHOD AND APPARATUS FOR REMOTELY CONTROLLING AN ELECTRICAL APPLIANCE

Jerry M. Hatfield, 6408 La Cumbre Rd., Camarillo, Calif. 93010

Filed Mar. 24, 1980, Ser. No. 133,559
Int. Cl.³ H04B *3/54*
U.S. Cl. 340—310 A **26 Claims**



1. Apparatus for remotely controlling an electrical appliance connected across an alternating current power line, the apparatus comprising:

a transmitter having an output adapted to be connected across an alternating current power line at a point remote from an appliance to be controlled, the transmitter including a capacitor, an inductor, a controlled rectifier having an anode, a cathode, and a gate electrode, means for connecting the capacitor, the inductor, and the anode and cathode of the controlled rectifier in series across the output, means during alternating current half cycles of one polarity for charging the capacitor, means during alternating current half cycles of the other polarity for firing the controlled rectifier rapidly to discharge the capacitor, and means for holding the controlled rectifier in a conducting state during the remainder of the alternating current half cycle after the controlled rectifier fires; and

a receiver adapted to be connected across an alternating current power line to couple the line to an appliance to be controlled, the receiver including means responsive to control pulses generated by the transmitter for controlling the transfer of power from the line to the appliance.

4,329,679

CHARGE COUPLED DEVICE FEEDBACK ANALOG-TO-DIGITAL CONVERTER USING SUCCESSIVE APPROXIMATIONS

William E. Jensen, San Pedro, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 10, 1979, Ser. No. 83,421
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **8 Claims**

1. A charge coupled device analog-to-digital converter formed on a semiconductive substrate for converting a sampled analog input signal into binary data by successive approximations, comprising:

an analog reference voltage generator having a plurality of n selectively latchable voltage sources for supplying an analog reference signal which is a combination of the outputs of the latched ones of said voltage sources;

a first charge flow channel in said substrate and an electrode structure capable of maintaining a potential well defined between two potential barriers in said channel for storing charge in an amount proportional to the height of said barriers;

transfer electrodes over said first channel for transferring charge beneath said electrode structure into said potential well;

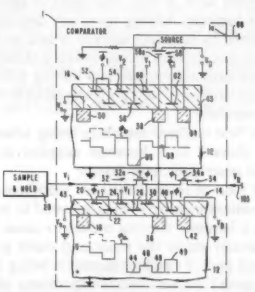
a first circuit controlling said electrode structure so as to periodically set the height of one of said barriers adjacent said potential well in proportion to said sampled analog input signal;

a second circuit controlling said electrode structure so as to periodically set the height of said one barrier adjacent said potential well in proportion to said analog reference signal, each setting of said barrier height in proportion to said analog input signal being accompanied by a corresponding setting of said barrier height in proportion to said reference signal, so that at least some of the stored charge overflows said well whenever the barrier height set in proportion to said input signal exceeds the barrier height set in proportion to said reference signal;

means, including a charge coupled regenerative feedback loop, for generating a logic signal when charge overflows said potential well after a given pair of said barrier height setting operation, said regenerative feedback loop comprising:

charge coupled means for sensing said overflow of charge from said potential well in said first channel;

a second charge flow channel in said substrate having an



electrode structure capable of maintaining a second potential well in said second channel for storing charge;

transfer electrodes over said second channel for transferring charge into said second potential well;

means controlling said second channel electrode structure operably connected to said means for sensing overflow in said first channel for reducing the amount of charge stored in said second potential well in response to said first channel means for sensing overflow so as to cause charge overflow from said second potential well in said second channel; and

means sensing said charge overflow in said second channel operably connected to said second channel controlling means to further reduce the amount of charge stored in said second potential well in response to said second channel charge overflow so as to remove a substantial amount of the stored charge from said second potential well whenever charge overflow occurs in said first channel;

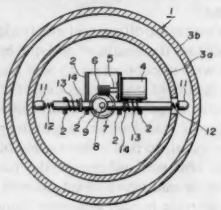
a shift register connected to sequentially address said n selectively latchable voltage sources so that a successive one of said voltage sources is addressed after each of said pair of charge setting operations; and

means connected to said shift register and to said reference voltage generator for latching each said voltage source upon it being addressed by said shift register whenever said addressing follows a pair of barrier setting operations which result in the generation of a logic signal.

4,329,680
DOUBLE GONG BELL

Tadashi Ishii, Kunitachi, Japan, assignor to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1980, Ser. No. 189,674
Int. Cl.³ G10K 1/064
U.S. Cl. 340—396 7 Claims



1. A double gong which comprises:

an outer gong and an inner gong separately arranged to accomodate said inner gong within a space defined by the inner surface of said outer gong;

means for slidably mounting at least two hammer driving members, said mounting means being positioned within a space defined by the inner surface of said inner gong and being formed with at least two pairs of apertures;

at least two hammer driving members disposed within the space defined by the inner surface of said outer gong, each of said hammer driving members being slidably positioned within said mounting means and having a first end closest to the inner surface of said gongs fixed to first end of a first resilient member;

each of said first resilient members being attached at a second end thereof to a hammer adapted to reciprocally strike said inner and outer gongs;

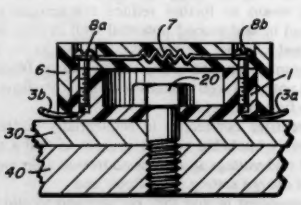
at least one pair of second resilient members, each of said second resilient members being adapted to act in conjunction with a hammer driving means to cause the hammers to reciprocally strike the inner and outer gongs, each of said second pair of resilient members being fixed at a first end to a point on said mounting means closest to said gongs and at a second end to a point on said hammer driving member intermediate one pair of the apertures formed in said mounting means; and

hammer driving means for moving said hammers reciprocally relative to said gongs to strike them and generate a bell sound.

4,329,681
TAMPER SENSOR SYSTEM

Zane W. Parsons, 2010 Ridgelawn Dr., Kenova, W. Va. 25530

Filed Sep. 18, 1980, Ser. No. 188,315
Int. Cl.³ G08B 13/22; B60R 25/10
U.S. Cl. 340—568 15 Claims

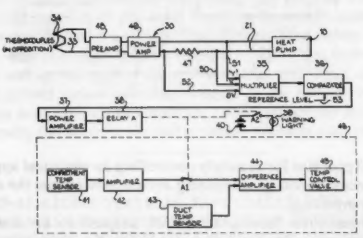


1. A tamper sensor system for protecting a screw or bolt secured to an object, comprising a housing including a cover means and a base means for protectively covering said screw or bolt, said base means being arranged about said screw or bolt, said cover means removably attached to said base means, electrical circuit means arranged within said cover means and said base means, said electrical circuit means having a normal state of operation; said electrical circuit means being arranged within said housing such that it will be open circuited or short circuited upon violation of said housing, and alarm sensor circuit means coupled to said electrical circuit means for sensing a change from said normal state of operation to said open circuited or short circuited condition.

4,329,682
PHASE CHANGE WARNING DEVICES

Michael J. Baker, Bedfordshire, England, assignor to Hawker Siddeley Dynamics Ltd., Hertfordshire, England

Continuation-in-part of Ser. No. 682,342, May 3, 1976, abandoned. This application Sep. 7, 1978, Ser. No. 940,176
Int. Cl.³ G08B 19/02
U.S. Cl. 340—581 13 Claims



1. A method of obtaining an indication of the onset of a change of physical state in a flowing fluid, said method including the steps of:

(a) directing a portion of said fluid into contact with a surface;

(b) utilizing electrical energy for thermo-electrically heat pumping said surface to maintain a constant temperature difference between said surface and said flowing fluid;

(c) monitoring the electrical energy utilized to maintain said constant temperature difference; and

(d) providing said indication when the monitored electrical energy changes in a predetermined manner.

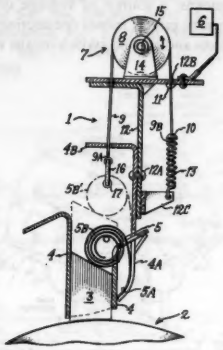
4,329,683
BRUSH WEAR INDICATOR FOR A DYNAMOELECTRIC MACHINE

Dan W. Kimberlin, Erie, Pa., assignor to General Electric Co., Schenectady, N.Y.

Filed Sep. 4, 1980, Ser. No. 183,904
Int. Cl.³ G08B 21/00
U.S. Cl. 340—679 16 Claims

1. A brush wear indicator for a dynamoelectric machine having a rotatably mounted electrical conductor on which a brush is slidably positioned and supported in a brush holder for reciprocal movement relative to the conductor, comprising: a self-winding, brush-biasing spring having one of its ends mounted in generally fixed operative relation to the brush holder and having a coiled portion at its outer end that is effective to rest on the outer end of a brush supported in the holder to bias the brush toward the rotatable conductor, a signal means for indicating a predetermined degree of brush wear, an electro-mechanical transducer operably connected between the coiled portion of said spring and the signal means to actuate the signal means responsive to the coiled portion of the spring being moved a predetermined distance toward the

rotatable conductor as a predetermined degree of brush wear occurs whereby an operator is alerted by actuation of the



signal means to the occurrence of said predetermined degree of brush wear.

4,329,684

APPARATUS USING A LIGHT SENSING SYSTEM FOR SENSING TIME MODULATED INFORMATION FROM A LIGHT EMITTING DEVICE

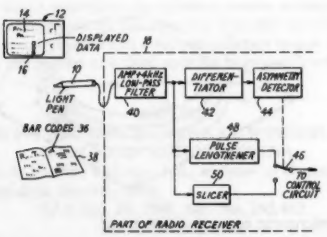
George D. Monteath, Tadworth, and Arthur H. Jones, Horsham, both of England, assignors to British Broadcasting Corporation, London, England

Filed Jan. 15, 1980, Ser. No. 112,377

Claims priority, application United Kingdom, Jan. 16, 1979, 7901510

Int. Cl.³ G09G 1/14

U.S. Cl. 340—707 **12 Claims**



1. An electronic control or data transfer system, comprising:

an electronic light emitting device;

means for selectively time modulating the light intensity at one or more selected regions of said light emitting device;

a manipulable electronic light sensor adapted to be selectively placed at a fixed position in front of said one or more selected regions of said electronic light emitting device; and

means connected to said light sensor for detecting the time modulation in the sensor output to form a pulse train of time sequential coded information identified with said time modulated light intensity of said selected region of said light emitting device.

4,329,685

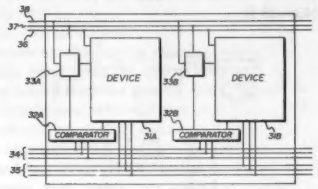
CONTROLLED SELECTIVE DISCONNECT SYSTEM FOR WAFER SCALE INTEGRATED CIRCUITS

Michael J. Mahon, Austin, Tex., and Roy R. Shanks, San Diego, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 9, 1980, Ser. No. 158,052

Int. Cl.³ H04Q 9/00; G11C 17/00

U.S. Cl. 340—825.84 **8 Claims**



1. An integrated circuit structure comprising:

a crystalline substrate having a plurality of circuits formed on the surface thereof;

power supply conductors provided for connection to each of said circuits; and

a circuit disconnect conductor provided to supply a power disconnect signal to each of said circuits;

each of said circuits including a power disconnect circuit having a gate coupled between one of said power supply conductors and said each circuit, said gate being coupled to said circuit disconnect conductor by a switch characterized by a phase transition with an associated large resistance change upon receipt of a circuit disconnect signal on said circuit disconnect conductor.

4,329,686

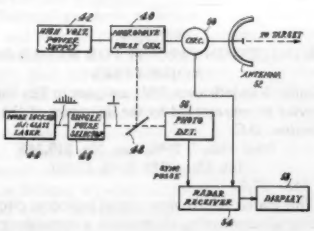
METHODS AND APPARATUS FOR GENERATING MICROWAVE PULSES AND FOR THE MEASUREMENT AND CONTROL THEREOF

Gerard Mourou, Rochester, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,691

Int. Cl.³ G01S 13/86

U.S. Cl. 343—6 R **21 Claims**



1. The method of generating a high power microwave pulse which comprises the steps of illuminating a body of semiconductor material with a light pulse having a duration in the picosecond range to switch a voltage in the kilovoltage range with a rise time in the picosecond range, supporting said semiconductor body in a waveguide, and translating said switching voltage into a microwave pulse having a duration in the picosecond range which is synchronous with said light pulse.

4,329,687

RADAR RADIATING POLARIZED SIGNALS

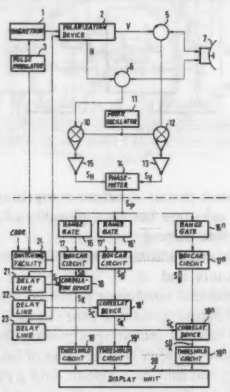
Volker Kloevekorn, Gerlingen, and Ullrich Raudonat, Schwieberdingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,682

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926193

Int. Cl.³ G01S *13/10*

U.S. Cl. 343—13 R **7 Claims**



1. A radar system for discriminating among targets on the basis of echo polarization characteristics, comprising:

transmitting means for radiating elliptically polarized signals switched between left and right hand sense according to a predetermined pattern;

said transmitting means including an antenna having two orthogonal radiating modes and means for generating a pair of mutually orthogonally phased RF signals exciting said antenna to radiate elliptically polarized waves;

receiving means responsive to echo signals from targets illuminated by said transmitting means, said receiving means separating said echo signals into first and second components having a mutual phase difference therebetween as a function of their relative polarization angle in said echo signals;

and means for evaluating said phase shift extant between said first and second echo signal components compared to that of said pair of RF signals generated in said transmitted means to provide a signal indicative of polarization correspondence.

4,329,688

SIGNAL INJECTION CIRCUIT FOR RADAR GAIN AND NOISE TESTS

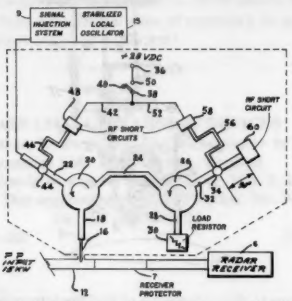
Harry Goldie, Randallstown, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 7, 1980, Ser. No. 119,345

Int. Cl.³ G01S *7/40, 13/00*

U.S. Cl. 343—17.7 **6 Claims**

1. An integrated microwave signal injection circuit for use with a radar system having an antenna, a transmitter connected to the antenna, a receiver and receiver protector connected to the antenna, where the receiver includes a built-in signal test system and wherein said microwave signal injection circuit is electrically connected between the antenna and receiver protector, comprising; first and second interconnected microwave circulators; a waveguide connecting the first circulator to the receiver protector input waveguide; a source of coherent microwave energy; waveguide means connecting said source to the first circulator means; a first switch means in the connecting waveguide for controlling the passage of RF energy; means connected to the second circulator for dissipating RF energy; a waveguide connected to the second circulator; diode means in the said waveguide for generating a noise signal, a second switch means; a source of voltage connected to the second switch means; circuit means connecting the first switch means, diode means and second switch means whereby closing



the second switch will prevent the passage of coherent RF energy past the first switch and cause a noise signal to be generated in the noise generating diode and transmitted to the receiver protector, and opening said second switch allows passage of coherent RF energy to the receiver protector and causes the noise generating diode to become quiescent.

4,329,689

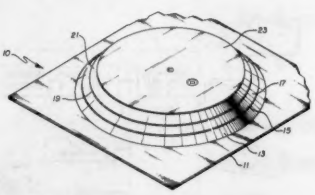
MICROSTRIP ANTENNA STRUCTURE HAVING STACKED MICROSTRIP ELEMENTS

James S. Yee, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 10, 1978, Ser. No. 949,565

Int. Cl.³ H01Q *1/38*

U.S. Cl. 343—700 MS **11 Claims**



1. A microstrip antenna, comprising:

a ground plane;

at least two microstrip elements disposed in a stack on top of said ground plane means, wherein each microstrip element comprises a conducting plane and a layer of dielectric material;

wherein the conducting planes are dimensioned to resonate at given frequencies which are relatively close to each other and wherein at least those conducting plates intermediate of said ground plane and the uppermost conducting plane have openings therethrough sufficient in area and located relative to each other such that in operation substantial electric field coupling occurs between the microstrip elements, thereby resulting in a microstrip antenna having a broadband frequency response covering said given frequencies.

4,329,690

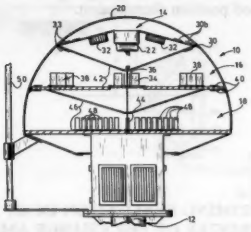
MULTIPLE SHIPBOARD ANTENNA CONFIGURATION

Ernest G. Parker, Morristown, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 959,801, Nov. 13, 1978, abandoned. This application Apr. 17, 1980, Ser. No. 141,037

Int. Cl.[3] H01Q *1/34, 21/28*

U.S. Cl. 343—709 6 Claims



1. A stacked multiple antenna system in a single, lightweight, compact, integrated unit for a ship mast top comprising a predetermined number of stacked antennas constituting a single substantially hemispherically shaped mast mounted structure while achieving sufficient isolation between antennas to permit the individual antenna to run freely without the impairment of operation of each:

a first antenna capable of generating a first electromagnetic wave radiation pattern, the first antenna being a parasitic element array antenna and being a Joint Tactical Distribution System (JTIDS) antenna;

a second different antenna proximal to and in stacked relationship therewith, the second antenna being a parasitic element array antenna and being a Tactical Air Navigation (Tacan) antenna;

a third antenna different from the first and second antenna and being proximal to and in stacked relationship with the second antenna with the second antenna interposed between the first and third antenna, the third antenna being a receiver of navigational signals and being a Global Positioning System (GPS) antenna;

an isolation system for isolating the antennas from one another such that the antennas do not interfere with one another's operation, the isolation means including a first isolation means for isolating the first and second antenna from one another and a second isolation means for isolating the second and third antenna from one another.

4,329,691

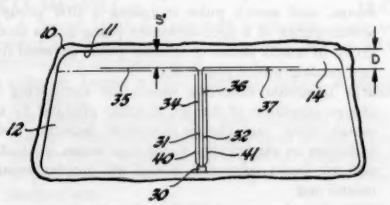
AM-FM BROADBAND VEHICLE WINDSHIELD MOUNTED RADIO ANTENNA

Thomas A. Prewitt, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 30, 1980, Ser. No. 192,463

Int. Cl.[3] H01Q *1/32*

U.S. Cl. 343—713 2 Claims



1. An AM-FM broadband radio antenna for a vehicle mounted radio providing reduced FM antenna impedance and comprising:

a metallic body element defining a substantially rectangular aperture;

a window in the aperture;

a common terminal supported on the window at the transverse center thereof;

first and second conductors supported by the window in the aperture in reversely symmetrical relation, each of the conductors having a first portion extending longitudinally across the substantial center of the window from the common terminal and a second portion extending transversely away from the first portion, the second portions being spaced from the metallic body element by more than ten centimeters, whereby slot coupling between the first and second conductors and the metallic body element, and thus impedance reflected into the antenna, is reduced; and

third and fourth conductors supported by the window in the aperture, said conductors extending from the common terminal adjacent and parallel to the first portions of the first and second conductors, said third and fourth conductors having lengths tuned to one quarter wavelengths within the FM broadcast band, whereby the impedance of the antenna in FM operation is further reduced, the impedance reductions providing improved FM performance.

4,329,692

PRIMARY RADAR ANTENNA HAVING A SECONDARY RADAR ANTENNA INTEGRATED THEREWITH

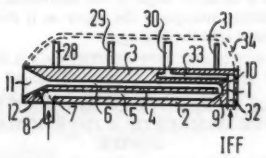
Anton Brunner, Wangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,767

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2925104

Int. Cl.[3] H01Q *13/00*

U.S. Cl. 343—780 41 Claims



30. A radar antenna comprising:

a primary radar antenna having a forward end and a rearward end and including

a cylindrical parabolic reflector,

first and second parallel plates extending spaced apart forwardly of said cylindrical parabolic reflector, and a third plate parallel and intermediate said first and second plates and spaced from said cylindrical parabolic reflector to define, with said first and second plates, upper and lower communicating interplate spaces,

wave deflection means at the junction of said first and second plates and said cylindrical parabolic reflector,

means defining a radiation opening at the forward end of said upper interplate space,

means closing the forward end of said lower interplate space, and

first feed means communicating with said lower interplate space for feeding in a primary radar signal; and

a secondary radar antenna mounted on top of said primary radar antenna, including

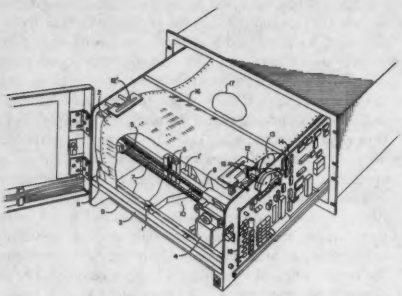
a plurality of radiator elements, and

second feed means communicating with at least one of said radiator elements adjacent said cylindrical parabolic reflector.

4,329,693
METHOD OF AND APPARATUS FOR DATA RECORDING AND THE LIKE

Robert E. Goldschmidt, Needham Heights; Charles C. Ku, Acton, and David A. Townzen, Winchester, all of Mass., assignors to Kaye Instruments, Inc., Bedford, Mass.

Filed Sep. 4, 1979, Ser. No. 71,947
Int. Cl.³ G01D *9/00, 9/28, 15/24;* B41J *3/46*
U.S. Cl. 346—33 TP **16 Claims**

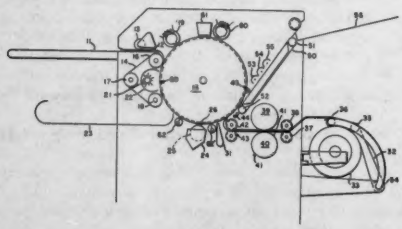


1. Printing apparatus for use with impact-sensitive paper having, in combination, means for mounting the paper as a continuous longitudinally extending substantially flat sheet to be directly viewed from one face thereof, print head means disposed at a location near the bottom of the other face of the sheet, means for causing the print head means to impact against said other face along transverse lines at said location to produce visible printing on the said one face, means for moving the paper substantially vertically upwardly after a transverse line is printed to permit immediate viewing of the data just printed, the data being printed to enable textual reading thereof from said one face from top to bottom of the sheet, and means for thereafter guiding the sheet downwardly and to a receiving tray inclined at an acute angle to the horizontal to enable the automatic folding storage of the paper as it drops a limited vertical distance into the tray.

4,329,694
AC CORONA TO REMOVE BACKGROUND FROM THE TRANSFER MEMBER OF A THERMOMAGNETIC COPIER

Donald W. Edwards; Emery J. Gorondy, both of Wilmington, Del., and Arend Van Roggen, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 771,381, Mar. 18, 1977, which is a continuation-in-part of Ser. No. 672,558, Mar. 31, 1976. This application Oct. 22, 1979, Ser. No. 87,077
Int. Cl.³ G11B *9/00*
U.S. Cl. 346—74.3 **7 Claims**

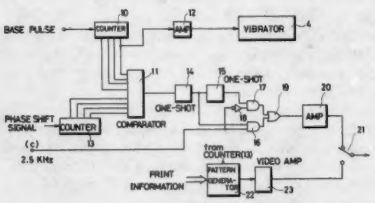


1. An apparatus for applying uncharged ferromagnetic toner particles to selected areas of a substrate comprising a movable layer of electrically grounded selectively magnetized ferromagnetic particles, drive means to advance said layer, means for applying nonconductive ferromagnetic toner particles to said layer, means for removing the nonconductive ferromagnetic toner particles from areas of said layer not selectively magnetized, means to bring a substrate into superposed position against said layer, means for applying an electric field to the substrate while it is superposed against the layer, means for removing said substrate from said layer, and a static neutralizing device adapted to neutralize any charges on any particles left adhering to said layer after said substrate has been removed from superposed position thereagainst.

4,329,695
CHARGE TIMING EVALUATION IN AN INK JET SYSTEM PRINTER OF THE CHARGE AMPLITUDE CONTROLLING TYPE

Masahiko Aiba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 26, 1980, Ser. No. 124,850
Claims priority, application Japan, Feb. 26, 1979, 54-22402
Int. Cl.³ G01D *18/00*
U.S. Cl. 346—75 **5 Claims**



1. An ink jet system printer of the charge amplitude controlling type comprising:

ink droplet issuance means having an ink liquid disposed therein for developing ink droplets therefrom at a given frequency;

charging means for charging said ink droplets in accordance with print information; and

phase synchronization means for synchronizing application of a charging signal to said charging means with separation timing of said ink droplets, said phase synchronization means comprising:

search pulse generation means for charging said ink droplets with a search pulse through the use of said charging means, said search pulse including a first group of search pulses of a predetermined phase and a second group of search pulses of another phase deviated from said predetermined phase; and

charge condition detection means for monitoring the charge condition of the ink droplets charged by said search pulse, said charge condition detection means including an electrically conductive means contacting said ink liquid contained in said ink droplet issuance means; and

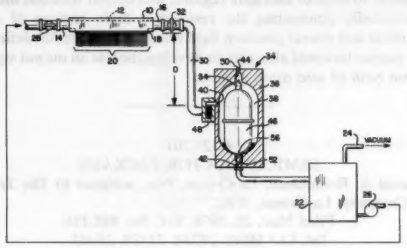
current detection means for detecting an electric curent flowing through said electrically conductive means to said ink liquid.

4,329,696

INK JET FLUID SYSTEM

George W. Denlinger, Springboro, Ohio; Robert A. Wiley, Richardson, and James H. Yu, Dallas, both of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Jul. 23, 1980, Ser. No. 171,594
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—75 18 Claims



1. An ink jet fluid system, comprising:

print head means defining a fluid reservoir and having a fluid inlet and a fluid outlet communicating with said reservoir, said print head means further including means defining at least one orifice communicating with said reservoir such that fluid supplied to said reservoir under pressure flows through said orifice and emerges from said print head as a jet drop stream,

fluid supply means, including a fluid supply tank, for supplying fluid to print head means,

inlet valve means, connected between said fluid inlet and said fluid supply system, for controlling flow of fluid to said fluid reservoir of said print head from said fluid supply means,

siphon line means, connected to said fluid outlet and extending downward therefrom below said orifice by a predetermined distance, and

float valve means, connected between said siphon line means and said fluid supply means, for venting the lower end of said siphon line means to atmosphere to produce a siphon action therethrough, while providing for fluid flow from said siphon line means to said fluid supply means, whereby when said inlet valve means is closed at shut-down of said print head means, the fluid within said reservoir is maintained at a pressure less than atmospheric pressure by said siphon line means such that fluid is prevented from flowing through said orifice.

4,329,697

INFORMATION RECORD

Alan E. Bell, E. Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 782,032, Mar. 28, 1977, abandoned.
This application Jul. 3, 1979, Ser. No. 54,437
Int. Cl.[3] G01D *15/34*
U.S. Cl. 346—135.1 13 Claims

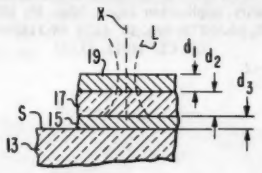
1. A record blank for use with a recording light source providing a light beam at a given frequency; said record blank comprising the combination of:

a substrate having a light reflecting surface at said given frequency;

a first coating overlying said light reflecting surface, said coating being substantially transparent at said given frequency for permitting at least a portion of said light beam to pass through said first coating to said light reflecting surface; and

a second coating overlying said first coating, said second coating comprising a metallic material which is light absorptive at said given frequency, for receiving light energy corresponding to information to be recorded on said record blank; the thickness of said second coating being such that said second coating is substantially transmissive to light of said given frequency;

the thickness of said first coating being greater than the thickness of said second coating;



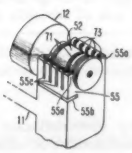
the thickness of said second coating being so related to the thickness of said first coating, and the optical constants of said substrate and the respective materials of said first coating and said second coating so as to establish an anti-reflective condition for said record blank at said given frequency with respect to the light beam from said light source incident on said second coating.

4,329,698

DISPOSABLE CARTRIDGE FOR INK DROP PRINTER

Normand C. Smith, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1980, Ser. No. 218,145
Int. Cl.[3] G01D *15/16*
U.S. Cl. 346—140 R 23 Claims



1. A cartridge for ink drop printing apparatus comprising:

housing means having an extended portion and forming a chamber communicating with said extended portion;

drop generating means supported in said extended portion by at least two resilient conductive elements, said drop generating means having separate conductive coatings on opposite surfaces thereof;

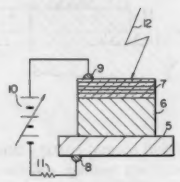
conductive paths on the exterior of said extended portion each connected through said extended portion to one of said resilient elements; and

reservoir means in said chamber for holding a quantity of marking fluid and being in communication with said extended portion and said drop generating means.

4,329,699
SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Shin-ichiro Ishihara, Moriguchi; Koshiro Mori, Osaka; Tsuneo Tanaka, Nishinomiya; Seiichi Nagata, Sakai, and Masakazu Fukai, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 21, 1980, Ser. No. 132,406
Claims priority, application Japan, Mar. 26, 1979, 54-35872; Mar. 26, 1979, 54-35873; Sep. 10, 1979, 54-115906
Int. Cl.[3] H01L *45/00*
U.S. Cl. 357—2 4 Claims

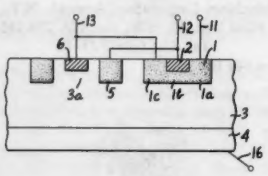


1. A semiconductor device comprising: a substrate,
first and second amorphous $Si_{1-x}C_x$ ($0 \leqq \times < 1$) films including hydrogen formed on one surface of said substrate, said first and second amorphous $Si_{1-x}C_x$ films having different x values, respectively, and
a pair of transparent electrodes provided to contact said first and second amorphous $Si_{1-x}C_x$ films respectively.

4,329,700
SEMI-CONDUCTOR INVERTER USING COMPLEMENTARY JUNCTION FIELD EFFECT TRANSISTOR PAIR

Kojiro Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation of Ser. No. 903,012, May 4, 1978, abandoned. This application Mar. 4, 1980, Ser. No. 127,182
Claims priority, application Japan, May 4, 1977, 52/51468
Int. Cl.[3] H01L *29/80*
U.S. Cl. 357—22 3 Claims

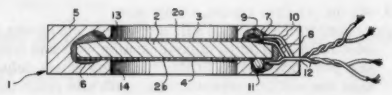


1. A complementary semiconductor integrated inverter circuit, comprising: a semiconductor substrate of one conductivity type having a high impurity concentration; an epitaxial semiconductor layer of the same conductivity type as said substrate formed on said substrate and having a low impurity concentration; a first semiconductor region of the same conductivity type as the substrate formed in a surface portion of said epitaxial layer; a second semiconductor region of the opposite conductivity type formed in a surface portion of said epitaxial layer around said first region and having a high impurity concentration; a third semiconductor region of the same conductivity type as said second region formed in a surface portion of said epitaxial layer a short distance from said second region; a fourth semiconductor region of the same conductivity type as said substrate formed in a surface portion of said third region; said substrate, first region, the portion of said epitaxial layer under said first region, and second region forming respectively the source, drain, channel and gate regions of a vertical junction field effect transistor; the third region further consisting of one end portion, another end portion and a center portion under said fourth region; said one end portion, other end portion, center portion and fourth region forming respectively the drain, source, channel and gate regions of a lateral junction field effect transistor; input terminal means electrically connecting the respective gate regions of said vertical and lateral junction field effect transistors for defining an input terminal effective to apply an input signal applied thereto to both of said gate regions; and output terminal means electrically connecting the respective drain regions of said vertical and lateral junction field effect transistors for defining an output terminal effective to develop thereat an output signal from both of said drain regions.

4,329,701
SEMICONDUCTOR PACKAGE

Daniel A. Brenneman, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Mar. 20, 1978, Ser. No. 888,116
Int. Cl.[3] H01L *29/34, 23/28, 23/02*
U.S. Cl. 357—28 4 Claims



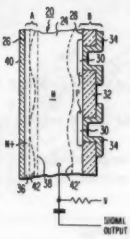
1. A semiconductor package comprising:
a. a semiconductor wafer assembly having first and second generally planar surfaces on opposite sides thereof, said surfaces being substantially parallel to each other and of approximately equal area, the outer edge portions of said surfaces lying substantially opposite each other so as to define the periphery of said semiconductor wafer assembly, at least the central portions of said surfaces being electrically conductive and defining electrodes of said semiconductor wafer assembly;
b. first and second membrane members in overlying, contiguous relationship to said respective first and second generally planar surfaces, said members being constructed of electrically conductive material;
c. a mass of retaining material encompassing the periphery of said semiconductor wafer assembly and sealingly engaging outer edge portions of said first and second membrane members, said retaining material being electrically insulating whereby the edge portions of said semiconductor package are effectively sealed and electrically insulated while central portions of said first and second membrane members remain exposed for use as electrodes of said semiconductor package; and
d. a temperature sensing element capable of producing an electrical signal related to its temperature, said element being disposed adjacent a peripheral portion of said wafer assembly in heat conductive relation thereto between one of said generally planar surfaces and its associated membrane member, said membrane member at least partially conforming to the shape of said element so as to be in intimate heat exchange contact therewith, whereby changes in the operating temperature of said semiconductor wafer assembly are rapidly and accurately sensed by said element; said peripheral portion being encompassed by said retaining material, and further comprising signal conductor means connected to said temperature sensing element and passing through said mass of retaining material to a point external of said package, whereby the operating temperature of said semiconductor wafer assembly may be monitored.

4,329,702

LOW COST REDUCED BLOOMING DEVICE AND METHOD FOR MAKING THE SAME

Lloyd F. Wallace, Coatesville, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1980, Ser. No. 143,026
Int. Cl.[3] H01L 27/14
U.S. Cl. 357—31 2 Claims



1. An image sensing device including a wafer of a single crystal semiconductor having a first surface with an input signal sensing region extending into said wafer from said first surface, means within said input signal sensing region for controlling blooming within said sensing region, and a second surface with a plurality of charge storage regions extending into said wafer from said second surface, the improvement wherein said means for controlling blooming comprises:

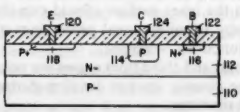
a recombination layer extending along approximately 100% of said first surface and spaced about 0.9–1.1 microns therefrom.

4,329,703

LATERAL PNP TRANSISTOR

Ury Priel, Cupertino; Jerry D. Gray, San Jose, and Allen H. Frederick, Pacifica, all of Calif., assignors to Monolithic Memories, Inc., Sunnyvale, Calif.

Division of Ser. No. 926,856, Jul. 21, 1978, Pat. No. 4,228,451, which is a division of Ser. No. 805,534, Jun. 10, 1977, Pat. No. 4,152,627. This application Apr. 18, 1980, Ser. No. 141,321
Int. Cl.[3] H01L 29/72, 29/78, 27/02, 27/04
U.S. Cl. 357—35 3 Claims



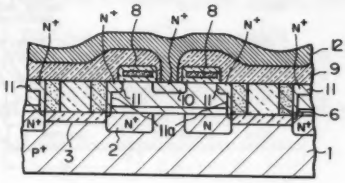
1. A lateral PNP transistor device comprising, in combination, a base region of N type conductivity, an emitter region and a collector region of P type conductivity laterally spaced from each other located in surface portions of said base region, and separate planar surface electrical contacts to said base region to said emitter region and to said collector region, said emitter region having a depth of no greater than about 0.5 microns, said collector region having a greater depth than said emitter region and having a lower concentration of impurities than said emitter region.

4,329,704

MOS RANDOM ACCESS MEMORY WITH BURIED STORAGE CAPACITOR

Junji Sakurai, Tokyo, and Kiyoshi Miyasaka, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 19, 1979, Ser. No. 76,993
Claims priority, application Japan, Sep. 20, 1978, 53-115276; Dec. 30, 1978, 53-165810
Int. Cl.[3] H01L 27/02, 29/78, 29/04
U.S. Cl. 357—41 7 Claims



1. A semiconductor memory device comprising an array of memory cells, each said memory cell comprising:

a substrate of a semiconductor material having a first conductivity type;

a semiconductor growth layer on said substrate including a single crystalline region of the same conductivity type as said substrate and polycrystalline region, said single crystalline region comprising a first layer having a relatively high impurity concentration formed on said substrate and a second layer having a relatively low impurity concentration formed on said first layer;

a buried semiconductor layer of the opposite conductivity type between a selected portion of the area between said substrate and said single crystalline region of said semiconductor growth layer;

a buried insulating layer adjacent to said buried semiconductor layer, said polycrystalline region of said semiconductor growth layer being formed over said buried insulating layer;

a first single crystalline impurity region of said opposite conductivity type formed in a selected portion of said single crystalline region of said growth layer;

a second single crystalline impurity region of said opposite conductivity type extending from the top surface of said semiconductor growth layer to said buried semiconductor layer and being adjacent to said polycrystalline region, and

a planar transfer electrode formed over a region separating said first and second single crystalline impurity regions.

4,329,705

VMOS/BIPOLAR POWER SWITCHING DEVICE

Richard H. Baker, Bedford, Mass., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 21, 1979, Ser. No. 40,991
Int. Cl.[3] H01L 27/04, 29/72, 29/78; H03K 17/56
U.S. Cl. 357—43 17 Claims

7. An integrated, high-speed, semiconductor power switching device comprising:

a substrate of a first conductivity type;

a first layer of said first conductivity type overlying one face of said substrate;

a second layer of a second conductivity type extending into one region of said first layer;

a third layer of said first conductivity type extending into said second layer;

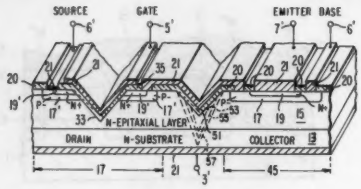
a fourth layer of said second conductivity type extending into another region of said first layer;

a fifth layer of said first conductivity type extending into said fourth layer;

a sixth layer of electrically insulative material overlying said first through fifth layers;

a first electrode overlying said sixth layer at a position above said second layer such that the first electrode may be used to induce a channel along said second layer between the first and third layers;

a second electrode overlying and electrically contacting the other face of said substrate;



a third electrode extending through said sixth layer for electrically contacting said fifth layer;

a fourth electrode overlying and extending through said sixth layer over said second, third, and fourth layers, for electrically connecting these latter three layers together; and

an isolation V-groove extending at least into said first layer between the regions of said second and fourth layers.

4,329,706

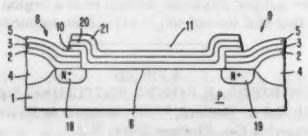
DOPED POLYSILICON SILICIDE SEMICONDUCTOR INTEGRATED CIRCUIT INTERCONNECTIONS

Billy L. Crowder, Putnam Valley, and Arnold Reisman, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 1, 1979, Ser. No. 16,647

Int. Cl.³ H01L *29/04, 23/48, 29/46*

U.S. Cl. 357—71 **7 Claims**



1. A semiconductor structure comprising:

a semiconductor crystal having an exposed device region surrounded by a region of recessed oxide;

a source type and a drain type particular conductivity type regions in said exposed device region defining a field effect type channel;

at least one combination of a first high conductivity type member composed of a doped polycrystalline silicon associated with silicide making ohmic contact to each said source and drain region; and

a second high conductivity type member composed of doped polycrystalline silicon associated with silicide over an oxide layer in said channel and overlapping at least one said first high conductivity type member.

4,329,707

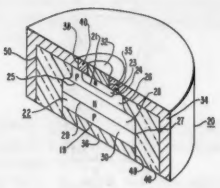
GLASS-SEALED POWER THYRISTOR

David L. Moore; John A. Ostop, both of Jeannette, and Joseph E. Johnson, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 942,577, Sep. 15, 1978. This application Jul. 16, 1980, Ser. No. 169,249

Int. Cl.³ H01L *23/30, 23/48, 29/44*

U.S. Cl. 357—73 **18 Claims**



1. A thyristor comprising:

(a) a body of semiconductor material having first and second substantially flat and opposed major surfaces and an edge portion extending therebetween, said body of semiconductor material including a first emitter region, a first base region, a second base region and a second emitter region with a first PN junction at the interface of said first emitter region with said first base region, a second PN junction at the interface of said first base region with said second base region and a third PN junction at the interface of said second base region with said second emitter region, said first emitter and base regions extending to said first substantially flat surface and said second emitter region extending to said second substantially flat surface;

(b) a cathode electrode having a first thickness affixed to said first emitter region along said first major surface of said body of semiconductor material;

(c) a cup shaped gate electrode having a second thickness affixed to said first base region along said first major surface of said body of semiconductor material such that said first PN junction extends to said first major surface of said body of semiconductor material between edge portions of said cathode electrode and said gate electrode, said cup shaped electrode encircling said body of semiconductor material;

(d) a first ring-shaped electrically insulating glass member affixed to said first major surface of said body a semiconductor material and, to edge portions of said cathode electrode and said gate electrodes thereby forming a seal protecting said first PN junction;

(e) an anode electrode having a third thickness affixed to said second emitter region along said second major surface of said body of semiconductor material, and

(f) a second ring-shaped electrically insulating glass member affixed to said edge portion of said body of semiconductor material and to the inner surface of said cup shaped gate electrode thereby forming a seal protecting said second and third PN junctions, wherein;

(g) said first, second and third thicknesses are selected such that destructive stresses do not develop during thermal cycling of said thyristor.

4,329,708

DIGITAL SIGNAL PROCESSING APPARATUS

Kaichi Yamamoto, Zama, and Kazuo Yoshimoto, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 30, 1980, Ser. No. 192,358

Claims priority, application Japan, Oct. 25, 1979, 54-138107

Int. Cl.³ H04N *5/14*; G06F *11/10, 11/12*

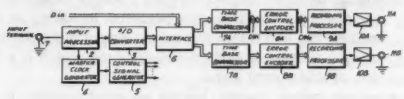
U.S. Cl. 358—36 **24 Claims**

1. A method of processing a digital signal which forms a data block for every predetermined number of bits, and which

includes error detecting and error correcting signals, said method comprising the steps of:

detecting each said error signal as an indication of an error in a respective data block of said digital signal;

writing in a first memory each data block which is free of error;



writing in a second memory a data block containing an error;

selectively reading out a data block from said first and second memories; and

correcting an error of a data block read out from said second memory by means of the respective error correcting signal.

4,329,709
SOLID-STATE COLOR IMAGING DEVICE

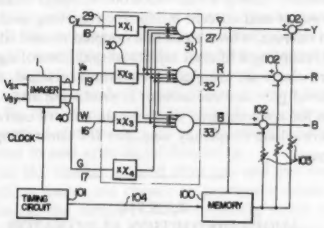
Michio Masuda, Yokohama; Hiroaki Nabeyama, Kamakura, and Toshiyuki Kurita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1980, Ser. No. 192,998

Claims priority, application Japan, Oct. 3, 1979, 54-126870

Int. Cl.³ H04N 9/04, 9/07

U.S. Cl. 358—44 **12 Claims**



1. A solid-state color imaging device comprising:

a plurality of photo-electric conversion elements equal in number to the number of picture elements required, arranged in horizontal and vertical directions;

horizontal and vertical scanning circuits for scanning said photo-electric conversion elements in the horizontal and vertical directions, respectively;

four different color filters arranged above said photo-electric conversion elements, said filters including first and second color filters alternately arranged above the photo-electric conversion elements in one of adjacent vertical directions, and third and fourth color filters alternately arranged above the photo-electric conversion elements in the other vertical direction;

first, second, third and fourth color signal lines connected to those of said photo-electric conversion elements which are related to said first, second, third and fourth color filters, respectively;

signal processing circuit means for processing signals from said first, second, third and fourth signal lines to produce three signal outputs necessary for color reproduction on three output lines;

a memory connected to a selected one of said three output lines of said signal processing circuit means for reading and writing information under the control of a timing signal, said memory being operable to store one horizontal scan period of signal output in a vertical blanking interval in one field of scan derived from said selected output line and to read out said stored signal output in the next field of scan; and

subtraction circuit means inserted intermediate said three output lines of said signal processing circuit means for receiving the output from said memory to subtract predetermined multiples of the output from said memory from the signal outputs on said three output lines, respectively.

4,329,710
COLOR COMPOSING VIDEO SYSTEM

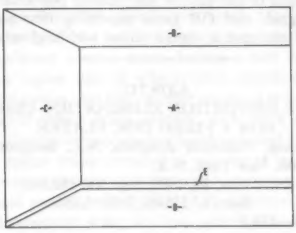
Harold C. Taylor, Unit 1, Industrial Estate, Earlston, Berwickshire, Scotland

Filed Aug. 20, 1980, Ser. No. 179,871

Claims priority, application United Kingdom, Sep. 4, 1979, 7930627

Int. Cl.³ H04N 9/00

U.S. Cl. 358—81 **10 Claims**



1. A video apparatus comprising:

a visual display unit (v.d.u.) for giving a color image in response to a set of three primary color signals;

scanning means for producing a raster scan on the v.d.u.;

color composing means adjustable by a user to produce a plurality of sets of primary color signals, each set defining a desired color;

segment generating means operating in synchronism with the scanning means to divide the image area into a plurality of segments to form a stylised simulation of a real object, and

gating means for gating a respective set of primary color signals to the v.d.u. during scanning of each segment;

whereby a simulation of the object with different parts each in a desired color may be achieved for visual evaluation.

4,329,711
APPARATUS FOR ENCODING OF INFORMATION

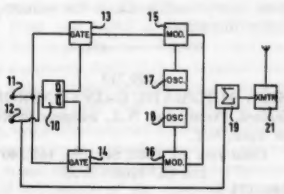
William S. H. Cheung, Hong Kong, Hong Kong, assignor to Payview Limited, Hong Kong, Hong Kong

Filed Nov. 6, 1979, Ser. No. 91,781

Claims priority, application United Kingdom, Feb. 20, 1979, 7905930

Int. Cl.³ H04N 7/16

U.S. Cl. 358—114 **6 Claims**



1. An apparatus for encoding an information signal in accordance with a data signal comprising:

means for inverting said data signal;

a first pair of gates each having an input connected to receive a noise signal, a control input, and an output, one of said control inputs connected to receive said data signal, the other of said control inputs connected to receive an inverted data signal from said means for inverting;

a second pair of gates each having an input connected to receive said information signal, a control input, and an output, one of said control inputs connected to receive said data signal, the other of said control inputs being connected to receive an inverted data signal from said means for inverting;

a first OR gate for combining the output of said gate of said first pair of gates which is controlled by said data signal and the output of said gate of said second pair which receives an inverted data signal; and

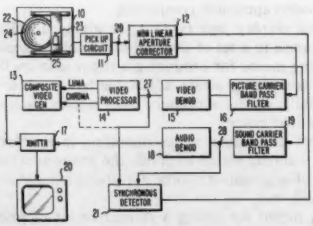
a second OR gate for combining the output of the gate of said first pair of gates receiving an inverted data signal and the output of the gate of said second pair receiving said data signal, said OR gates providing first and second related information signals mixed with said noise signal.

4,329,712

ADAPTIVE DISTORTION ELIMINATION CIRCUITRY FOR A VIDEO DISC PLAYER

Frank B. Lang, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 24, 1980, Ser. No. 162,592
Int. Cl.³ H04N *5/76, 5/21*
U.S. Cl. 358—128.5 **14 Claims**



1. In a disc record player for information recovery of video and sound signals, an apparatus comprising:

means for recovering modulated information signals including video signals with sound accompaniment from a disc record, said recovery means having a non-linear response;

an adjustable non-linear compensating means, coupled to said recovery means, for reducing intermodulation distortion in the recovered signals;

means, coupled to said compensating means, for demodulating the information signals; and

a synchronous detector means responsive to said demodulated information signals and to recovered sound accompaniment components for providing a control signal to the non-linear compensating means for reducing said intermodulation distortion.

4,329,713

TELEVISION AUTOMATIC GAIN CONTROL SYSTEM

Jack R. Harford, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

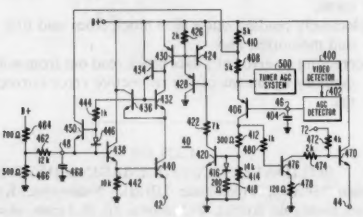
Filed Jun. 26, 1980, Ser. No. 163,146
Int. Cl.³ H04N *5/52*
U.S. Cl. 358—174 **4 Claims**

1. In a television receiver, including an intermediate frequency amplifier which is responsive to a gain control current for variably amplifying an intermediate frequency signal; and a video detector which is responsive to said amplified intermediate frequency signal for producing a detected video signal; an automatic gain control system comprising:

an AGC detector coupled to said video detector and responsive to said video signal for producing an output signal which is representative of the level of said amplified intermediate frequency signal;

a voltage divider, coupled between a source of supply voltage and a point of reference potential, including an intermediate tap, and responsive to said output signal for developing a voltage at said intermediate tap which is a function of said output signal;

a current mirror circuit, having an input coupled to said intermediate tap and responsive to the voltage thereat for



developing a control signal, at a first output, and a gain control current at a second output;

a filter circuit coupled between said first output of said current mirror and a point of reference potential;

a transistor having a first electrode coupled to said second output of said current mirror for receiving said gain control current, a base electrode coupled to said filter circuit for receiving a filtered replica of said control signal, and a third electrode coupled to an output terminal, at which a filtered gain control current is produced; and

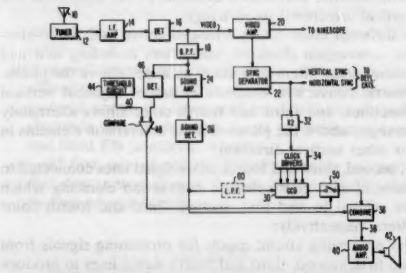
means for applying said filtered gain control current to said intermediate frequency amplifier for controlling the gain thereof.

4,329,714

AUDIO DISTORTION ELIMINATOR

Dalton H. Pritchard, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 26, 1980, Ser. No. 210,790
Int. Cl.³ H04N *5/60*
U.S. Cl. 358—198 **7 Claims**



1. An audio distortion elimination circuit comprising:

a source of carrier waves frequency modulated by audio information and subject to undesired decreases in the amplitude of said waves;

an FM detector coupled to receive said carrier waves and having an output at which is produced an audio signal

which may contain sound buzz components resulting from said undesired amplitude decreases;

a comb filter, including a relatively undelayed signal path and a relatively delayed signal path coupled in parallel between the output of said FM detector and means for combining the delayed and undelayed signals conducted by said paths, said combining means having an output at which comb filtered audio signals are produced, said delayed signal path including a delay line, and said delay line exhibiting a delay which provides said comb filter with a response exhibiting points of maximum attenuation at a frequency of recurrence of said undesired amplitude decreases and at harmonics thereof; and

means, coupled to the output of said combining means, for reproducing said audio signals.

7. In a television receiver, apparatus for reducing sound buzz comprising:

a source of television signals including horizontal sync signal components recurring at a given frequency, and an FM sound carrier signal which is subject to amplitude modulation interference at frequencies harmonically related to the field frequency of said television signals;

an FM detector coupled to receive said FM sound carrier signal for producing an audio signal;

a comb filter including

means having first and second inputs and an output for combining a relatively delayed and a relatively undelayed audio signal;

a first signal path coupled between said FM detector and said first input of said combining means for supplying relatively undelayed audio signals to said first input;

a second signal path including a charge-coupled device delay line of a given number of serially-coupled elements coupled between said FM detector and said second input of said combining means for supplying relatively delayed audio signals to said second input; and

clocking means coupled to said charge-coupled device delay line for transferring said audio signals through said serially-coupled elements at a given rate which is harmonically related to said sync signal frequency,

wherein the number of said elements and the rate of said clocking means are chosen to produce a comb filter response at the output of said combining means exhibiting periodic nulls at the fundamental and harmonic frequencies of said field frequency; and

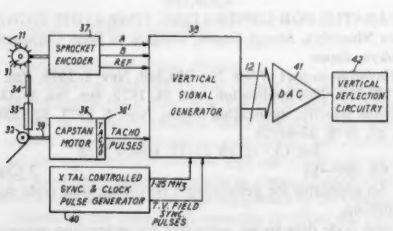
means coupled to the output of said combining means for reproducing said audio signals.

4,329,715

APPARATUS FOR USE IN SCANNING A CINEMATOGRAPH FILM

Stephen P. Attridge, London, England, assignor to Transcan Video Limited, London, England

Filed Oct. 6, 1980, Ser. No. 194,319
Int. Cl.³ H04N 3/36
U.S. Cl. 358—214 **3 Claims**



1. Apparatus for use in scanning a cinematograph film from which a television video signal is to be produced while the film is being moved in a continuous manner, the apparatus comprising:

film transport means for moving cinematograph film in a continuous manner;

means defining a film scanning region;

signal generating means for generating pulses representative of rate of movement of a film in said transport means, and signals representative of direction of movement of said film and arrival of a predetermined point along the length of each film frame at a reference point in said film scanning region;

raster reference rate means for producing a raster reference signal having a repetition rate representative of the rate of increase of the vertical coordinate of a scanning raster of the dimensions required for scanning a frame of a film in the absence of movement of the film;

steering means coupled to said signal generating means to receive therefrom pulses and signals representative respectively of rate and direction of movement of said film;

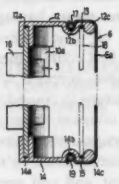
first up/down counter means having a reset input and two clock inputs one of which when supplied with clock pulses causes said first counter means to count up and the other of which when supplied with clock pulses causes said first counter means to countdown, said signal generating means being coupled to said reset input to supply thereto a resetting signal at each occurrence of the arrival of said predetermined point of a respective film frame at said reference point, and said steering means being coupled to said two clock inputs to supply selectively to one or the other thereof, in dependence on direction of film movement represented by said signal from said signal generating means, pulses representative of rate of film movement, said first counter means being adapted to reset to a count representative of said reference point, whereby in each counting cycle of said first counter means the count therein is representative of the position of said predetermined point of each respective film frame during the time in which said predetermined point moves from said reference point to a position reached when the predetermined point of the next film frame entering said scanning region arrives at said reference point;

second up/down counter means having a reset input and two clock inputs one of which when supplied with clock pulses causes said second counter means to count up and the other of which when supplied with clock pulses causes said second counter means to count down, said raster reference rate means being coupled to said second counter means to supply clock pulses thereto for counting in the direction required for producing count values representative of an increasing vertical coordinate of a scanning raster for scanning a film frame in the absence of movement of the film, and said steering means being coupled to said two clock inputs of said second counter means to supply selectively to one or the other thereof, in dependence on direction of film movement represented by said signal from said signal generating means; raster start means for supplying start signals indicative of times at which a scanning raster is to be initiated, said raster start means being coupled to supply said start signals as resetting signals to said reset input of said second counter means, said second counter means being so coupled to said first counter means at each start signal, whereby the count value in said second counter means is representative of the vertical coordinate of the scanning raster required for scanning a film frame in said scanning region; and converter means coupled to said second counter means to produce an analog signal representative of said count value in said second counter means.

4,329,716
COMBINATION TELEVISION PICTURE PROJECTION SCREEN UNIT AND ORNAMENTAL COVER UNIT THEREFOR

Daniel A. Porco, 1050 Fifth Ave., New York, N.Y. 10028

Filed Nov. 29, 1979, Ser. No. 98,705
Int. Cl.³ H04N 5/65
U.S. Cl. 358—231 10 Claims



1. In combination, a television picture projection screen unit comprising: a screen support framework having a vertical exposable projection screen surface therein upon which is to be projected a greatly enlarged image of the picture on the front face of a television cathode ray tube or the like, and opposite marginal portions positioned outwardly of the portions of said projection screen surface which are to receive the projected image; and a removable ornamental cover unit mounted on said framework and comprising a flexible foldable or rollable ornamental projection screen covering portion having an ornamental face stretched across said opposite marginal portions of said screen support framework so as to hide from view said projection screen surface when the screen surface is not in use, and opposite marginal anchoring portions engaged with receiving means on said support framework for making a releasable connection therewith.

4,329,717
FACSIMILE METHOD AND APPARATUS FOR SETTING WHITE LEVEL

James A. Logie, Orlando, and Arthur G. Wilson, Maitland, both of Fla., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

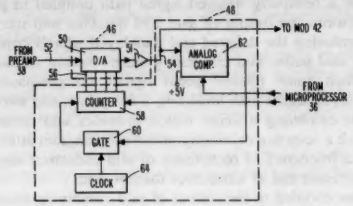
Filed Feb. 11, 1980, Ser. No. 120,340
Int. Cl.³ H04N 1/40
U.S. Cl. 358—282 12 Claims

1. Facsimile apparatus for transmitting facsimile signals comprising:

scanning means for scanning a document from one extremity to another extremity and prescanning said document from said other extremity to said one extremity;

sensor means for sensing the document located at said scanning means for sensing dark/light variations in said document;

variable gain amplifier means coupled to said sensor means; and

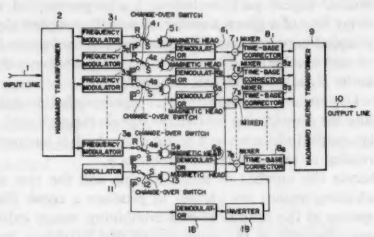


gain control means for setting said variable gain during said prescanning.

4,329,718
VIDEO TAPE RECORDING AND REPRODUCING APPARATUS WITH LINE BASE CORRECTION

Kenji Kimura, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Feb. 19, 1980, Ser. No. 122,179
Claims priority, application Japan, Feb. 20, 1979, 54-18740; Apr. 18, 1979, 54-47759
Int. Cl.³ H04N 5/785
U.S. Cl. 360—9 6 Claims



1. A video-tape recording and reproducing apparatus comprising a transformer system to divide the field signal into multi-channel transformer signals; a system to record and reproduce these multi-channel transformer signals using a multiple magnetic head; a jitter detection head to record and reproduce fixed frequency signals placed in juxtaposition with the above-mentioned magnetic heads; and a system to mix the jitter component signal produced by the jitter detection head, after pole reversal, into each channel of the above-mentioned transformer signal.

4,329,719
APPARATUS FOR GENERATING TIME CODE SIGNALS

Ichiro Ninomiya, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

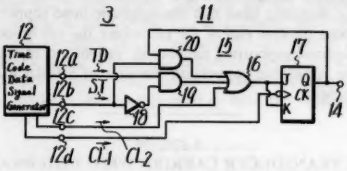
Continuation-in-part of Ser. No. 956,449, Nov. 1, 1978, Pat. No. 4,189,756. This application Apr. 18, 1979, Ser. No. 31,031
Claims priority, application Japan, Nov. 5, 1977, 52-132853; Apr. 20, 1978, 53-46934
Int. Cl.³ G11B 27/32; H04N 5/78
U.S. Cl. 360—14 3 Claims

1. An apparatus for generating a recording time code signal comprising:

a time code data signal generator for generating successive multi-bit binary time code data signals;

a time code signal forming circuit which is supplied with said successive time code data signals for producing corre-

sponding successive recording time code signals, each consisting of a multi-bit bi-phase code signal which, at any given time, has one of two signal levels and in which the value of each bit is represented by the number of transitions between said signal levels during a bit interval; and means provided in said time code signal forming circuit for detecting which of said signal levels said bi-phase coded



signal has during a predetermined binary bit in each of said successive recording time code signals and for causing said predetermined bit to maintain its signal level if said detected signal level is a first of said signal levels and otherwise to change its signal level, so that a bit immediately following said predetermined bit within each of said successive recording time code signals starts with a transition to a predetermined one of said two signal levels.

4,329,720

CASSETTE TAPE RECORDER WITH STOP MECHANISM WHICH DETECTS THE STOP OF A TAPE RUN

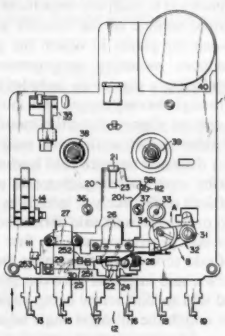
Hisao Kodama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 29, 1980, Ser. No. 125,921

Claims priority, application Japan, Mar. 5, 1979, 54/25444; Mar. 5, 1979, 54/27757; Mar. 5, 1979, 54/27758

Int. Cl.[3] G11B *15/44, 19/26*

U.S. Cl. 360—74.3 **24 Claims**



1. A tape recorder comprising:

a chassis;

a motor supported by said chassis;

a first operation member on said chassis and operable to set tape recorder to a slow tape run mode and movable between an operation position and a non-operation position;

a second operation member on said chassis and operable to set the tape recorder to a fast tape run mode and movable between an operation position an non-operation position;

a first rotary member rotatably supported by the chassis and rotated by the motor and operable to effect the run of a tape when the first or second operation member is locked in an operation position;

a second rotary member rotatably attached to the chassis and adapted to rotate while the tape runs and brought to rest when the tape run is stopped;

a third rotary member rotatably attached to the chassis, said third rotary member being movable relative to the chassis and into engagement with the first and second rotary members in response to the locking of the first operation member in the operation position to cause the second rotary member to be rotated, and said third rotary member being movable relative to said chassis to disengage from the operation position to cause the third rotary member to be disengaged from the second rotary member, said third rotary member including an engagement section rotatable therewith;

a tape run stop detection mechanism for detecting the stop of the tape run and operable to take action corresponding to said detection, said tape run stop detection mechanism including a movable means provided with an engagement member which is urged in one direction by the rotation of the second rotary member to prevent engagement of said tape run stop detection mechanism with said engagement section, said engagement member being operable to engage with said engagement section at the stop of the second rotary member, said movable means being movable in another direction resulting from the engagement between said engagement member and engagement section and the rotation of the third rotary member, and an urging member for producing at the movement of said movable means an urging force acting in a direction opposite to that which results from said engagement between said engagement member and engagement section, whereby the tape run stop detection mechanism takes the action of moving the movable means in the direction resulting from said engagement between said engagement member and engagement section when the mechanism detects the stop of the tape run;

a release mechanism for unlocking said first or second operation member from its respective operation position when the tape run stop detection mechanism takes said action, said release mechanism being connected with said tape run stop detection mechanism and operable in response to movement of said movable means in the direction resulting from the engagement between said engagement member and engagement section.

4,329,721

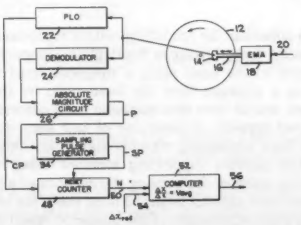
TACHOMETER FOR DERIVING AVERAGE VELOCITY OUTPUT BY SAMPLING POSITION SIGNAL

Patrick S. Lee, Campbell, and John Cuda, Saratoga, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Feb. 11, 1980, Ser. No. 120,453

Int. Cl.[3] G11B *19/14, 21/08*

U.S. Cl. 360—78 **1 Claim**

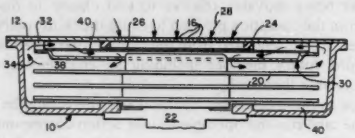


1. An electronic tachometer for producing a signal indicative of the average speed V_{avg} of a disc pack data storage system servo head moving radially of a rotating servo disc having a plurality of concentric servo tracks recorded thereon, comprising:

4,329,722
ENCLOSED DISC DRIVE HAVING COMBINATION FILTER ASSEMBLY

Terence H. West, San Jose, Calif., assignor to Priam Corporation, San Jose, Calif.

Filed May 15, 1980, Ser. No. 150,042
Int. Cl.³ G11B *23/02, 25/04*
U.S. Cl. 360—98 **13 Claims**

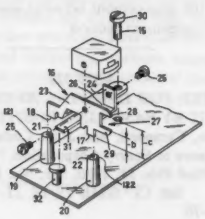


1. An enclosed disc drive comprising a container including a bottom portion and a mating top portion, a spindle and drive motor mounted in the bottom portion with said spindle positioned for receiving magnetic disc means, magnetic disc means mounted onto the spindle within said bottom portion and rotatable by said drive motor, a first air filter centrally positioned in said top portion above said spindle for communicating air between said container and the ambient atmosphere, a second filter mounted to the inside surface of said top portion above said magnetic disc means and positioned about said first filter, said second filter having an opening near the periphery of said container for receiving air and means for directing filtered air towards said spindle.

4,329,723
ADJUSTABLE MOUNTING FOR A MAGNETIC TAPE HEAD

Johannes J. M. Schoenmakers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1980, Ser. No. 121,337
Claims priority, application Netherlands, Feb. 16, 1979, 7901230
Int. Cl.³ G11B *21/24, 5/56*
U.S. Cl. 360—109 **9 Claims**



1. An apparatus for recording and/or reproducing signals on a magnetic tape, having a head plate, supporting members connected to the head plate, a magnetic head support positioned at a distance from the head plate by the supporting members, and at least one magnetic head carried on the magnetic head support, at least one of said supporting members being a fixed supporting member rigidly attached to the head plate, and another supporting member being an adjustable supporting member for varying the distance of a portion of the magnetic head support from the head plate, for influencing the azimuth angle adjustment of the magnetic head by pivoting the magnetic head support; and a flat plate member attached to said magnetic head support and having projecting limbs which constitute a tape guide for guiding the lower and the upper edges of the magnetic tape respectively,

wherein the flat plate member further comprises at least one tab having a free end extending in the direction of the head plate, the fixed support member having a slotted opening which widens wedge-like in the direction of the magnetic head support, in which opening the free end of the tab is received and bearing against the fixed support member, and

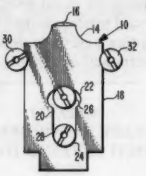
the apparatus further comprises means for biasing said tab toward the head plate,

said fixed supporting member and adjustable supporting member being so arranged with respect to each other and the magnetic head that the magnetic head support pivots about the free end of the tab where the tab bears against the fixed supporting member in response to adjustment of the adjustable supporting member to influence azimuth angle.

4,329,724
TAPE TRANSDUCER CARRIER WITH DIHEDRAL AND PROTRUSION ADJUSTMENT

Richard W. Clayton, Medford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 9, 1980, Ser. No. 138,735
Int. Cl.³ G11B *21/24*
U.S. Cl. 360—109 **2 Claims**



1. In a tape record and/or replay system of the type wherein at least two transducers are disposed about the cylindrical surface of a scanner which rotates to scan tracks at an angle to the direction of tape travel, the improvement comprising:

a transducer mounting arrangement including means for making adjustment to both the transducer protrusion from the cylindrical surface of the scanner and the dihedral angle between the planes in which the gaps reside, said (the) transducer mounting arrangement (of claim 1 wherein) including a carrier (is included) with a keyhole slot therethrough having major and minor arcuate portions from centers aligned along the transducer protrusion axis, and further including first and second tapered-head screws (are) disposed through said keyhold slot to retain said carrier by separately engaging said major and minor arcuate portions respectively at interfaces at opposite ends of (the) said protrusion axis, said carrier being positionable along (the) said protrusion axis by first loosening (one) said first of said screws and tightening the (other) second of said screws, said interface between said minor arcuate portion and said second screw being substantially a pivot point about which the dihedral angle adjustment is made.

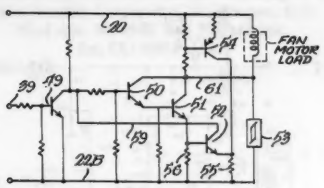
4,329,725
CONTROL CIRCUITRY FOR MULTISTAGE FANS

Robert E. Hart, Clearwater, Fla., assignor to Square D Company, Palatine, Ill.

Division of Ser. No. 83,034, Oct. 9, 1979. This application May 15, 1981, Ser. No. 264,373
Int. Cl.³ G05F *1/58*
U.S. Cl. 361—18 **1 Claim**

1. A fold-back current limiting circuit for protecting associated circuitry from damage from a short existing for a period of up to fifteen minutes, said fold-back circuit comprising first, second and third NPN transistors each having a base, emitter and collector, a fourth PNP transistor having a base, emitter and collector, said first and second transistors being connected

as a Darlington pair, first and second resistors, said first transistor having its collector connected to an associated load, said first resistor having a relative much higher resistance than said second resistor, the emitter of said second transistor being connected to said second resistor, and to the base of said third transistor, the emitter of said third transistor being connected to the junction of said fourth transistor and said first resistor, said fourth transistor being connected in series with said first resistor across the power supply line, the second transistor being connected to the base of said fourth transistor, the collector of said third transistor being connected to the base of said first transistor, and first and second transistors being normally in saturation and causing said fourth transistor to provide current flow through said first resistor to hold the voltage at



the emitter of said third transistor at a constant level, the second transistor providing some current flow in said second resistor such that the emitter of said second transistor is at a higher voltage than the emitter of said third transistor and in normal operation the base voltage of said first transistor is high and the collector current of the third transistor is low upon the occurrence of a short, said fourth transistor being turned off thereby reducing the voltage across said first resistor, the second transistor emitter current thence establishing the voltage across said second resistor and driving the third transistor to saturation, and the collector current of said third transistor reducing the base drive to said first transistor to take said first and second transistor out of saturation, such that the collector emitter voltage of said second transistor will rise and its collector current will decrease thereby limiting the output current.

4,329,726

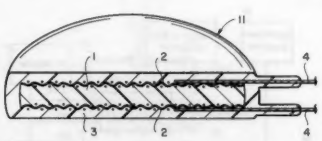
CIRCUIT PROTECTION DEVICES COMPRISING PTC ELEMENTS

Lee M. Middleman, Portola Valley; Joseph H. Evans, and Donald F. Pettengill, both of Palo Alto, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 965,344, Dec. 1, 1978, Pat. No. 4,238,812. This application Nov. 30, 1979, Ser. No. 98,712

Int. Cl.³ H02H *9/02*

U.S. Cl. 361—58 **62 Claims**



1. An electrical circuit which comprises

(1) a source of electrical power;

(2) a circuit protection device comprising at least two electrodes and a PTC element composed of a PTC composition having a switching temperature T_s; and

(3) other circuit elements which are connected in series with said PTC element and which have an impedance R_L ohms;

said electrical circuit having a normal operating condition in which

(A) current flows through said PTC element over an area of equivalent diameter d with an average path length t such that d/t is at least 2;

(B) said device is at a temperature T_{dn} at which the device has a resistance R_{dn} which is

(a) less than 1 ohm; and

(b) less than $0.5 \times R_L$ ohm,

and at which said PTC composition has a resistivity of less than 10 ohm. cm.;

(C) said device is in contact with a medium which is at a temperature T_n; and

(D) there is a stable equilibrium between the rate at which the device generates heat by I^2R heating and the rate at which heat is lost from the device;

and said device having an electrical power/temperature relationship and being capable of losing heat to said medium at a rate such that

(a) if said medium is heated slowly from T_n while maintaining R_L and the voltage of the source of electrical power substantially constant, the temperature of the device increases slowly until the equilibrium between the rate at which the device generates heat by I^2R heating and the rate at which heat is lost from the device becomes unstable, at which unstable equilibrium point the medium is at a temperature T_{crit}, the device is at a temperature $T_{d\ trip}$ and has a resistance $R_{d\ trip}$, and the rate at which the resistance of the device changes with temperature, $dR_{d\ trip}/dT_{d\ trip}$ is positive; and

(b) if said medium is then heated just above T_{crit}, the rate at which the device generates heat by I^2R heating exceeds the rate at which heat can be lost from the device and thus causes the temperature and the resistance of the device to rise rapidly and the circuit current to fall until a high temperature stable equilibrium point is reached at which the rate at which the device generates heat by I^2R heating is equal to the rate at which heat is lost from the device; at which high temperature stable equilibrium point, the device is at a temperature $T_{d\ latch}$ and has a resistance $R_{d\ latch}$ which is such that the ratio of the power in the circuit in the normal operating condition to the power in the circuit at said high temperature stable equilibrium point, the Switching Ratio, is at least 8.

4,329,727

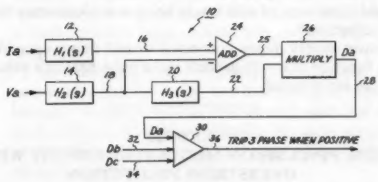
DIRECTIONAL POWER DISTANCE RELAY

William J. Premerlani, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 16, 1980, Ser. No. 169,434

Int. Cl.³ H02H *3/16, 3/18*

U.S. Cl. 361—80 **12 Claims**



1. A method of detecting power line faults in a three-phase power line to select the correct circuit breaker opening operation comprising:

(a) generating a single-phase discriminant for each single-phase line of said three-phase power line by multiplying an operate signal and a polarizing signal for said single-phase line wherein said single-phase discriminant is indicative of the presence or absence of a fault on said single-phase line within the reach of a relay; and

(b) summing the single-phase discriminants to produce a three-phase discriminant indicative of presence or absence of a fault on more than one of said three phases;

(c) wherein said operate signal is related to the difference of (1) the product of the current and a replica impedance for said single-phase line and (2) the voltage of said single-phase line; and

(d) wherein said polarizing signal is related to the voltage of said single-phase line.

4,329,728
TRANSISTOR PUSH-PULL OUTPUT STAGE

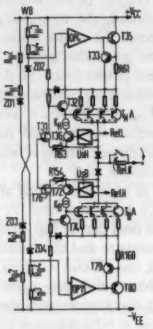
Klaus Welzhofer, Graefelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,549

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951928

Int. Cl.³ H02H *3/20*

U.S. Cl. 361—91 **6 Claims**



1. A transistor output circuit including a plurality of push-pull output stages, particularly for pulse shapers having inverse feedback from the output to the input and a high-resistance input and a low-resistance output, comprising:

an input transistor in each push-pull stage comprising a field effect transistor;

a plurality of output transistors and an emitter-follower in each of said stages;

constant current sources driving respective ones of said output transistors via said emitter followers, said constant current sources cut off in response to an overvoltage above a predetermined level at said output transistors;

sensing means connected to said output transistors and to said current sources and operable to cut off said current sources in response to an overvoltage;

said transistors of said stages being complementary to each other; and

power supply means connected to said stages operable as a function of a voltage shift and a pulse base line voltage of an input signal.

4,329,729
SIDE PINCUSHION MODULATOR CIRCUIT WITH OVERSTRESS PROTECTION

Peter R. Knight, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1980, Ser. No. 162,211

Int. Cl.³ H02H *3/20*

U.S. Cl. 361—91 **5 Claims**

1. A side pincushion correction circuit with overstress protection, comprising:

a deflection winding;

a trace capacitance coupled to said deflection winding for developing a trace voltage;

first switching means for applying said trace voltage to said deflection winding to generate a deflection trace current in said deflection winding;

a first retrace capacitance coupled to said deflection winding for generating a deflection retrace current in said deflection winding;

a modulator inductance;

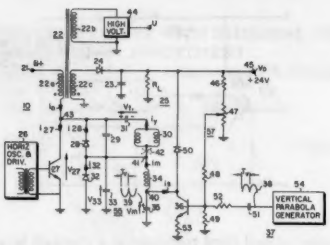
a modulator capacitance coupled to said modulator inductance for developing a modulator voltage;

second switching means for applying said modulator voltage to said modulator inductance to generate a sawtooth modulator current in said modulator inductance;

a second retrace capacitance coupled to said modulator inductance for generating a retrace current in said modulator inductance;

a source of operating voltage;

means including a flyback transformer winding coupled to



said source of operating voltage for charging said trace and modulator capacitances;

controllable shunting means coupled to said modulator capacitance and responsive to bias voltages for developing a shunt current to control said trace and modulator voltages;

means for applying to said controllable shunting means a vertical rate bias voltage to vary said shunt current at a vertical rate to provide side pincushion correction;

a source of reference voltage; and

means for clamping said modulator capacitance to said source of reference voltage to bypass current from said modulator capacitance when the voltage thereacross exceeds a predetermined level.

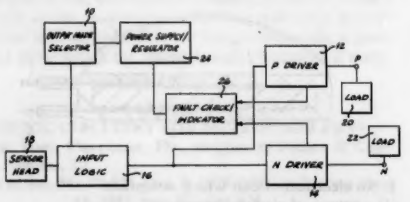
4,329,730
D.C. SWITCH CIRCUIT

Lawrence J. Ryczek, Greendale, and Donald L. Van Zeeland, Greenfield, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 12, 1980, Ser. No. 158,760

Int. Cl.³ H02H *3/00*

U.S. Cl. 361—100 **16 Claims**



1. A switching circuit, for receiving a signal from a sensing means and for driving a load in response to said signal, comprising in combination:

means for regulating and supplying power to said circuit;

at least one means for driving said load using power supplied by said power regulation and supply means;

input logic means for receiving said signal from said sensing

means and controlling said driving means in response thereto;

means for indicating faults in said load being driven by and being responsive to the output of said driving means and being operable to indicate a power-on condition and both short-circuit and open-circuit faults; and

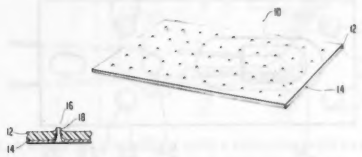
means for selecting, as the output mode of said driving means, between a normally open mode and a normally closed mode.

4,329,731

DISCHARGE SUPPRESSING DIELECTRIC FILM FOR USE ON SPACECRAFT SURFACES

Andrew Meulenberg, Jr., Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Apr. 30, 1980, Ser. No. 145,086
Int. Cl.³ H05F 3/00
U.S. Cl. 361—218 2 Claims



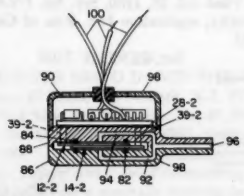
1. In a spacecraft of the type having a film coating thereon, said coating comprising a layer of dielectric material overlying a metallic layer, the improvement comprising: a plurality of points of ground potential exposed through said dielectric film, and a plurality of apertures in said dielectric film, said apertures containing grounded conductors for suppressing abrupt electric discharge through said dielectric film wherein said apertures comprise punctures formed by pushing said metallic layer through said dielectric film from the metallized side thereof.

4,329,732

PRECISION CAPACITANCE TRANSDUCER

Fred Kavli, Woodland Hills; Kyong Park, and John J. Affel, both of Chatsworth, all of Calif., assignors to Kavlico Corporation, Chatsworth, Calif.

Filed Mar. 17, 1980, Ser. No. 130,695
Int. Cl.³ H01G 7/00
U.S. Cl. 361—283 11 Claims



1. A mechanically floated precision low cost pressure transducer comprising:

first and second thin non-circular plates of glass;

frit means for bonding said plates of glass together with said two plates being generally aligned but with exposed areas of each of said first and second plates extending past the edges of the other plate and said plates being spaced apart by a distance in the order of one-half to a few thousandths of an inch, said frit extending substantially around a central open area of said plates;

conductive coatings on the adjacent opposed surfaces of said respective plates of glass, forming a capacitor which is variable in accordance with pressure applied to the exterior surfaces of said plates, said conductive coating extending to exposed areas of said plates;

resilient means for mounting said first and second glass plates and for concurrently applying pressure from a medium of which the pressure is to be measured to the outer surfaces of both said first and second plates, whereby the capacitance of said capacitor varies in accordance with the variations in the applied pressure of said medium;

associated output electronic circuitry; and

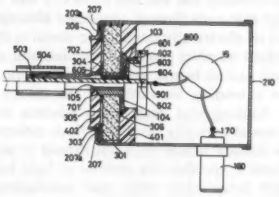
resilient conductive elements interconnecting said output circuitry and conductive material on the exposed areas of said plates.

4,329,733

CAPACITOR COMBINED SHIELD CASE

Katsuo Ito, and Bunjiro Murata, both of Kanazawa, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 29, 1979, Ser. No. 70,601
Claims priority, application Japan, Sep. 11, 1978, 53-125103[U]; Sep. 11, 1978, 53-125104[U]
Int. Cl.³ H01G 4/42
U.S. Cl. 361—302 14 Claims



1. A capacitor combined shield case, comprising:

(A) a capacitive component including:

(1) a doughnut shaped dielectric unit having first and second opposed faces and a central aperture formed therein;

(2) first and second electrodes formed on said first and second opposite faces, respectively, of said dielectric unit; and

(3) a feedthrough conductor inserted through said aperture in said dielectric unit, said feedthrough conductor having a flange portion in contact with said first electrode and a raised portion located at the outer periphery of said flange portion and extending away from said dielectric unit;

(B) a cylindrical shield case made of electrically conductive material and having first and second openings formed therein, the portion of said case surrounding said first opening defining a fixing portion, said second opening being sufficiently large to permit said dielectric unit to be placed in said case;

(C) said capacitive component being located in said case with said second electrode in contact with said fixing portion and said dielectric unit being sandwiched between said flange portion and said fixing portion;

(D) a first resin layer located in said case along said first face of said dielectric unit; and

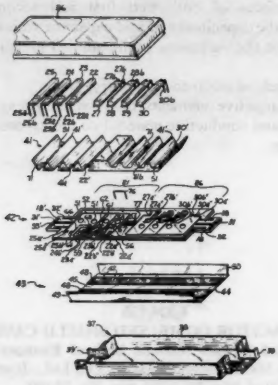
(E) a shield cover made of an electrically conductive material covering said second opening in said shield case.

4,329,734

FLASH LAMP ARRAY HAVING ELECTRICAL SHIELD

Edward L. Latos, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 28, 1980, Ser. No. 115,926
Int. Cl.³ F21K 5/02; G03B 15/02; H05B 41/34
U.S. Cl. 362—13 7 Claims



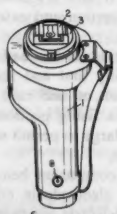
1. A multiple flash lamp array comprising a vertically elongated circuit board having circuitry for sequentially firing flash lamps and a plurality of elongated flash lamps of the electrically fired type positioned over the front of said circuit board and lying horizontally and stacked vertically and having lead-in wires at the side ends thereof connected electrically to said circuitry, and an electrically conductive shield in the form of a conductive sheet member positioned behind and substantially parallel to said circuit board, said shield being provided with side portions extending forwardly of the circuit board and substantially flanking said flash lamps wherein the improvement comprises electrically insulative flash indicator material on the inside surface which does not extend to said side portions as a means to increase the amount of light being emitted from the flash lamp array while also maintaining sufficient physical spacing between said circuitry and the side portions of said conductive sheet to avoid short circuiting therebetween.

4,329,735

ROTARY HOT SHOE MECHANISM

Michio Kawazoe, 30-11 5 chome Higashi, Narita Suginami ku, Tokyo, Japan

Continuation of Ser. No. 935,652, Aug. 21, 1978, abandoned.
This application Dec. 26, 1979, Ser. No. 107,273
Int. Cl.³ G03B 15/02
U.S. Cl. 362—18 6 Claims



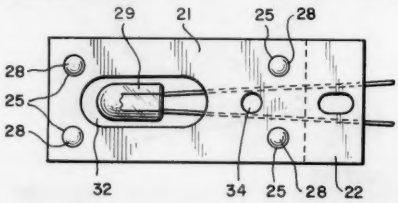
1. A rotary hot shoe mechanism in which a hot shoe is mounted at the upper face of a strobo grip rotatably so as to be rotatable by the hand of an operator but not to be rotatable by gravity force acting on the strobo, a center contact and the ground contact of said shoe slidably engaging two ring shaped contacts respectively which are fixed in the strobo grip concentrically, said fixed contacts being connected to a cable connector.

4,329,736

LAMP SUPPORT APPARATUS

Gunther Nelle, Bergen, and Johann Oberhans, Buchoster, both of Fed. Rep. of Germany, assignors to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 26, 1979, Ser. No. 6,887
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 2806071
Int. Cl.³ G01D 11/28
U.S. Cl. 362—23 15 Claims



1. In an electro-optical measuring device, the improved apparatus for supporting a miniature lamp comprising:

a mounting plate secured to the measuring device;

at least one damping element secured to the mounting plate, said damping element corprising an elastomeric member having high internal damping;

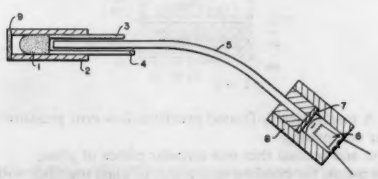
means for securing the at least one damping element to the lamp such that the at least one damping element simultaneously provides resilient support to the lamp and damps motion of the lamp with respect to the mounting plate.

4,329,737

LIGHT-EMITTING DIODE ARRANGEMENT

Adolf Triller, Munich, and Helmut Gassenhuber, Söcking, both of Fed. Rep. of Germany, assignors to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Filed Jul. 28, 1980, Ser. No. 172,951
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930383
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 7 Claims

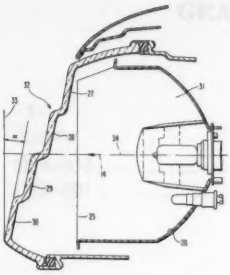


1. Light-emitting diode arrangement with a light-emitting diode that is light-transmissive in an axial direction, for use in examining instruments for ophthalmic optics, characterized in that the light-emitting diode is combined with an additional, switchable light source, the light of which penetrates the light-emitting diode from its rear face toward its light-emitting side.

4,329,738
COVER FOR MOTOR VEHICLE LIGHTS

Werner Heinz, Tiefenbronn; Adolf Schmidt, Sindelfingen, and Arno Jambor, Vaihingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,262
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907286
Int. Cl.³ F21V *5/04, 13/00*
U.S. Cl. 362—61 20 Claims



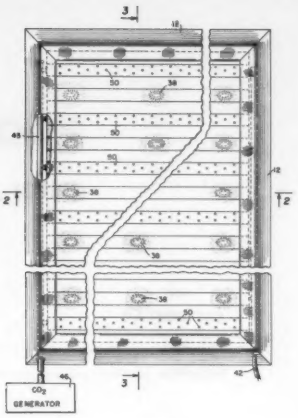
1. A cover for a headlight with a reflector, with a cover part which is stepped and overlaps at least the reflector, said part comprising sections staggered parallel to one another and stepped back opposite to a longitudinal axis of the vehicle, characterized by the fact that the stepping of parts runs in at least one plane which is one of horizontal and vertical in the installation position, is somewhat like a staircase, and runs in said plane monotonically from one side of the cover part to the opposite side, whereby in the installed position, the side of the cover part which projects farthest in the direction of the longitudinal axis in the horizontal plane has sections having light passing planes which contain positionally corresponding points which lie on lines which are directed in the direction of the longitudinal axis and also towards the center of the vehicle, and in the vertical plane to the lowest side of the vehicle, and by the fact that parts are positioned diagonally rearward in the installed position and inclined inward toward the reflector, and in the plane which is one of a horizontal plane in the installed position to form an acute azimuth angle β and a plane which is vertical in the installation position to form an acute elevation angle α with a reference plane which is at right angles to an optical headlight axis.

4,329,739
LIGHTED DISCO DANCE FLOOR

William Loebner, 27 Crane St., Newark, N.J. 07104

Filed Mar. 16, 1979, Ser. No. 21,191
Int. Cl.³ F21S *1/14;* G09F *19/00*
U.S. Cl. 362—153 2 Claims

1. A portable, roll-up dance floor comprising, a set of elongated hollow slats having a generally rectangular cross section disposed assembled in lengthwise juxtaposition, each slat comprising a top wall and side walls, each slat having means for assemblying the slats juxtapositioned lengthwise for assembly and disassembly thereof without moving the slats relative to each other axially, means internally of at least some of the hollow slats connected in circuit for lighting at least an area of the dance floor, the slats in said area having said top walls thereof pervious to light to allow said area of the dance floor to be lighted, said means comprising internally of each of at least some said hollow slats a tube pervious to light within the corresponding slat and extending longitudinally therein, electric lamp bulbs within each said tube spaced longitudinally

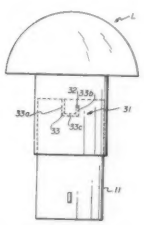


therein, and said electric lamp bulbs being arranged in a pattern within said area of said dance floor.

4,329,740
BAR LIGHT

Darrell W. Colvin, 1140 S. 101 Est Ave. #50, Tulsa, Okla. 74128

Filed Jul. 15, 1980, Ser. No. 169,199
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—184 10 Claims



1. A bar light for signaling waitresses and the like comprising, in combination, a base an illuminating cap, means for detachably and telescopically mounting said cap on said base for vertical reciprocating movement between an upper position and a lower position, means for yieldingly urging said cap upwardly into said upper position, a pair of lamps of different colors mounted on said base for illuminating said cap, a source of electric power in said base, circuit means including a switch operatively associated with said cap for connecting said pair of lamps selectively and alternatingly to said source of power, said switch being movable into one position upon a second movement of said cap downwardly from said upper position into said lower position for connecting the other of said lamps to said source of power wherein said switch is a two position rotary step switch of the pushbutton type and wherein said cap includes a bottom plate having a cup-shaped central portion provided with a central opening with a bulb supporting socket extending therethrough and supported on the upper wall of said base, said step switch being disposed on an upper wall of said base with said pushbutton being arranged by engagement by said bottom plate central portion during the downward movement of said cap whereby said circuit means are isolated for contamination or the like by their exclusion from the environment, said circuit means substantially disposed in said base.

DESIGN PATENTS

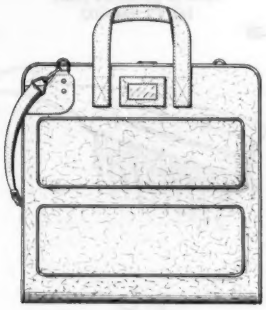
GRANTED MAY 11, 1982

ERRATA

For CLASS	See PATENT NO.
D34–038	264,323
D92–001	264,389

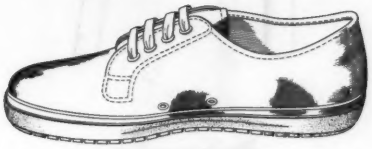
264,265
WEARING APPAREL POCKET
Pauline Trigere, 525 Park Ave., New York, N.Y. 10021
Filed Sep. 17, 1980, Ser. No. 188,139
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25

264,266
HANGING SUITCASE
Marvin Cooper, New Rochelle, N.Y., assignor to Dynamic Classics, Ltd., New York, N.Y.
Filed May 20, 1980, Ser. No. 151,744
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71



264,267
LUGGAGE
Ted Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Jan. 15, 1981, Ser. No. 225,414
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

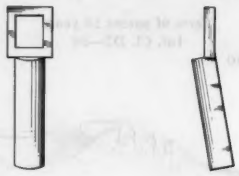
264,268
SHOE
Aubrey Askew, Lancashire, England, assignor to Dunlop Limited, London, England
Filed Aug. 28, 1979, Ser. No. 70,632
Claims priority, application United Kingdom, Mar. 3, 1979, 988815
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



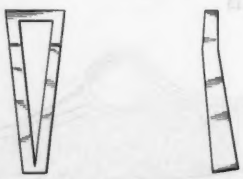
264,269
SHOE
Clifford C. Snyder, 875 Donner Way, Salt Lake City, Utah 84108
Filed Sep. 7, 1979, Ser. No. 73,512
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—313

264,270
PULL TAB FOR SLIDE FASTENER
Robert E. Brinley, Southington, Conn., assignor to Scovill Inc., Waterbury, Conn.
Filed Aug. 23, 1979, Ser. No. 68,884
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415

264,271
PULL TAB FOR SLIDE FASTENER
Robert E. Brinley, Southington, Conn., assignor to Scovill Inc., Waterbury, Conn.
Filed Aug. 23, 1979, Ser. No. 69,113
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415

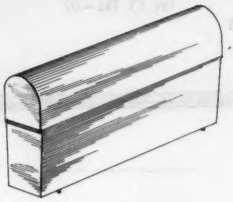


264,272
PULL TAB FOR SLIDE FASTENER
Robert E. Brinley, Southington, Conn., assignor to Scovill Inc., Waterbury, Conn.
Filed Aug. 27, 1979, Ser. No. 69,813
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415

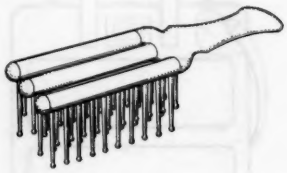


264,273
SLIDE FASTENER PULL TAB
Robert E. Brinley, Southington, Conn., assignor to Scovill Inc., Waterbury, Conn.
Filed Oct. 29, 1979, Ser. No. 89,023
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—415

264,274
CASE FOR A HAIRSETTER TRAVEL KIT
John J. Raab, Lakewood, N.J., assignor to Conair Corporation, Edison, N.J.
Filed May 19, 1980, Ser. No. 151,512
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—39



264,275
HAIR BRUSH
Salvatore J. Megna, 3721 Fair Oaks Blvd., Sacremento, Calif. 95825
Filed Apr. 21, 1980, Ser. No. 142,072
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35



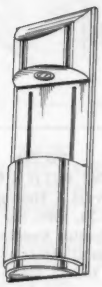
264,276
COMBINED SEAT AND MIRROR
Raymond Poelvoorde, and Lawrence F. Steiner, both of New York, N.Y., assignors to Volume Shoe Corporation, Topeka, Kans.
Filed Jan. 31, 1980, Ser. No. 117,247
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—4

264,277

LIGHTED MERCHANDISE DISPLAY UNIT

Raymond Poelvoorde, and Lawrence F. Steiner, both of New York, N.Y., assignors to Volume Shoe Corporation, Topeka, Kans.

Filed Jan. 31, 1980, Ser. No. 117,248
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—20

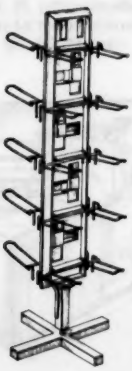


264,278

DISPLAY STAND

Peter L. Waines, Enfield, England, assignor to The Gillette Company, Boston, Mass.

Filed Mar. 10, 1980, Ser. No. 128,415
Term of patent 14 years
Int. Cl. D6—*85, 157, 04*
U.S. Cl. D6—28

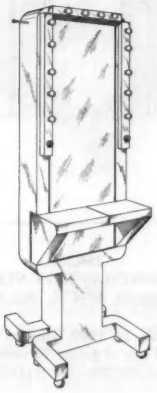


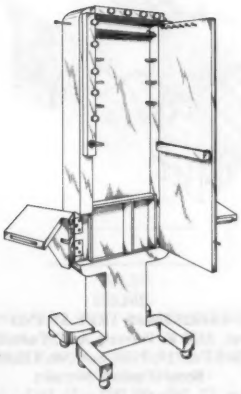
264,279

COMBINED VANITY AND STORAGE UNIT

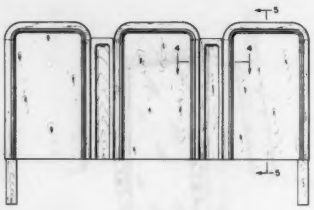
Mark W. Zabrowsky, 129 Tracy Pl., Hackensack, N.J. 07601

Filed Apr. 3, 1980, Ser. No. 136,876
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—29

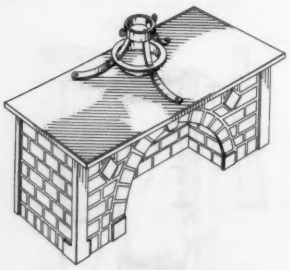




264,280
HEADBOARD
Huey T. Keller, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.
Filed Feb. 21, 1980, Ser. No. 123,288
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79

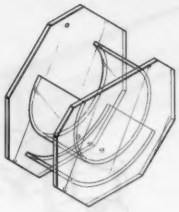


264,281
CHRISTMAS TREE STAND
Lawrence J. Okruszynski, 4074 N. 68th St., Milwaukee, Wis. 53216
Filed Feb. 19, 1980, Ser. No. 122,429
Term of patent 14 years
Int. Cl. D6—*99;* D11—*05*
U.S. Cl. D6—105

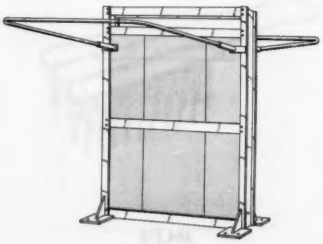


264,282
CHRISTMAS TREE STAND
David W. Blavat, 3328 E. Waverly Ave., Tucson, Ariz. 85716
Filed Feb. 19, 1980, Ser. No. 122,668
Term of patent 14 years
Int. Cl. D6—*99;* D11—*05;* D12—*14*
U.S. Cl. D6—105

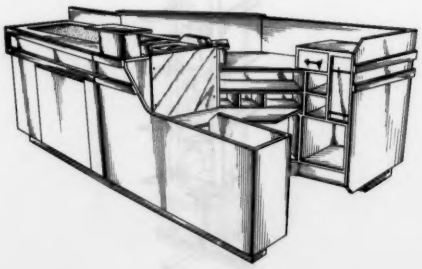
264,283
WALL MOUNTED PLANTER
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77057
Filed Mar. 31, 1980, Ser. No. 136,065
Term of patent 14 years
Int. Cl. D6—*06;* D11—*02*
U.S. Cl. D6—130



264,284
WALL ELEMENT WITH A CURTAIN CLASP
Bill P. Nedermann, Halalid 3, Helsingborg, Sweden (S-252 33)
Filed Mar. 31, 1980, Ser. No. 135,509
Claims priority, application Sweden, Oct. 31, 1979, 79-2407
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—135

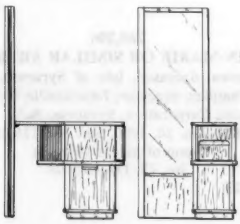


264,285
MARKET CHECK OUT STAND
Roderick J. Frederick, 1205 6th Ave. South, Seattle, Wash. 98134
Continuation-in-part of Ser. No. D. 821,972, Aug. 4, 1977, abandoned. This application May 27, 1980, Ser. No. 153,065
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—143

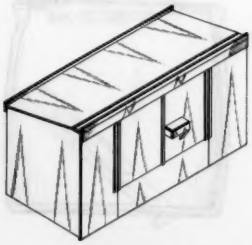


264,286
HOUSEHOLD STORAGE RACK OR SIMILAR ARTICLE
John Van Koert, New York, N.Y.
Filed Sep. 23, 1977, Ser. No. 836,196
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—153

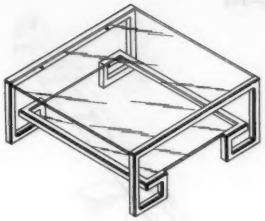
264,287
COMBINED ACCESSORIES CABINET AND MIRROR UNIT, PRIMARILY USED BY A BEAUTICIAN
Hidetoshi Yoshiyuki, Bridgewater, N.J., assignor to Takara Company, Somerset, N.J.
Filed Mar. 24, 1980, Ser. No. 133,445
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—159



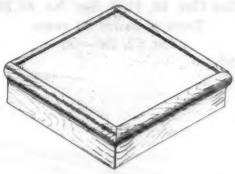
264,288
COMBINED STORAGE CHEST AND TABLE
Harvey N. Heather, Arcadia, Calif., assignor to American Sheds, Inc., Azuza, Calif.
Filed Nov. 26, 1979, Ser. No. 97,390
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—168



264,289
COCKTAIL TABLE OR SIMILAR ARTICLE
Richard S. Klein, Hollywood, Calif., assignor to The Charlton Company, Compton, Calif.
Filed May 29, 1979, Ser. No. 43,332
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

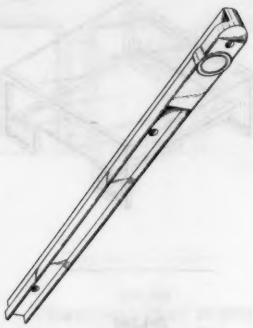


264,290
TABLE OR SIMILAR ARTICLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Sep. 5, 1979, Ser. No. 72,765
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



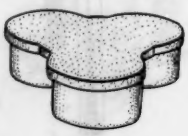
264,291
TABLE
Paul Haigh, New York, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Filed Feb. 27, 1980, Ser. No. 125,207
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

264,292
DRAWER RUNNER
Leon G. Litchfield, and Terence Hardy, both of Belper, England, assignors to L.B. (Plastics) Limited, Derby, England
Filed Oct. 3, 1979, Ser. No. 81,346
Claims priority, application United Kingdom, Apr. 21, 1979, 989481
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



264,293
DRAWER RUNNER
Leon G. Litchfield, and Terence Hardy, both of Belper, England, assignors to L.B. (Plastics) Limited, Derby, England
Filed Oct. 16, 1979, Ser. No. 85,283
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

264,294
CORNER CONNECTING APPARATUS
Herbert C. Schulze, P.O. Box 6070, Incline Village, Nev. 89450
Filed Feb. 7, 1980, Ser. No. 119,571
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



264,295
PICTURE FRAME
David P. Lage, Manchester, and Albert P. Carney, Ellisville, both of Mo., assignors to Quick Point, Inc., Fenton, Mo.
Filed Oct. 8, 1980, Ser. No. 195,233
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—245

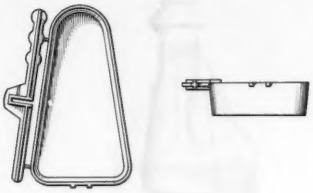
264,296
BAIN-MARIE OR SIMILAR ARTICLE
George B. Jensen, deceased, late of Syracuse, N.Y., and by Stanley F. Campion, executor, Fayetteville, N.Y., assignors to Syracuse China Corporation, Syracuse, N.Y.
Filed Jan. 28, 1980, Ser. No. 116,019
Term of patent 14 years
Int. Cl. D7—*01, 02*
U.S. Cl. D7—23

264,297

CONFECTIONERY MOLD WITH ATTACHED HANDLE

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Filed May 22, 1978, Ser. No. 908,101
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—43

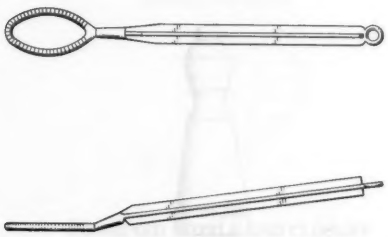


264,298

CANDY DIPPING TOOL

Ervan E. Guttman, Cincinnati, Ohio, assignor to The Ervan Guttman Company, Cincinnati, Ohio

Filed May 23, 1980, Ser. No. 152,651
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—103



264,299

HAND TOOL FOR LOOSENING OR TIGHTENING NUTS IN PLACE OF A SPANNER WRENCH

Roy J. Mefferd, 219 W. Myrtle St., Laurens, Iowa 50554

Filed Mar. 19, 1980, Ser. No. 131,702
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

264,300

PIN SOCKET INSERTION TOOL

Donald E. Imm, Baldwin Park, Calif., assignor to Zero Corporation, El Monte, Calif.

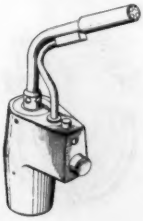
Filed May 2, 1979, Ser. No. 35,251
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—28

264,301

PIEZOELECTRICALLY IGNITED PORTABLE PROPANE GAS HAND TORCH

Harry C. Miller, One Security Dr., Nicholasville, Ky. 40356

Filed Mar. 21, 1980, Ser. No. 132,688
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



264,302
HOOK
Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Apr. 25, 1980, Ser. No. 143,606
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

264,303
HOOK
Ruediger Einhorn, Katonah, N.Y., assignor to Coats and Clark, Inc., Stamford, Conn.
Filed Apr. 25, 1980, Ser. No. 143,926
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

264,304
UNASSEMBLED DOOR KNOCKER UNIT
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed Jun. 27, 1977, Ser. No. 810,604
The portion of the term of this patent subsequent to Jul. 29, 1994, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D8—401

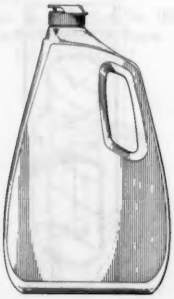
264,305
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 30, 1980, Ser. No. 145,117
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

264,306
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 30, 1980, Ser. No. 145,118
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

264,307
PERFUME BOTTLE
Isidore Capelouto, 13 Bd de la Pcesse Charlotte, Monte-Carlo, Monaco
Filed Aug. 6, 1979, Ser. No. 64,193
Claims priority, application France, Feb. 13, 1979, 42.165
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—352

264,308
BOTTLE
George E. Campbell, Pleasanton, Calif., assignor to The Clorox Company, Oakland, Calif.
Filed Oct. 3, 1979, Ser. No. 81,549
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376

264,309
COMBINED BOTTLE AND CLOSURE
Richard L. Weckman, Perrysburg, Ohio, and Elliott E. Blank, Fairfax, Calif., assignors to The Clorox Company, Oakland, Calif.
Filed Oct. 29, 1979, Ser. No. 89,181
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—376

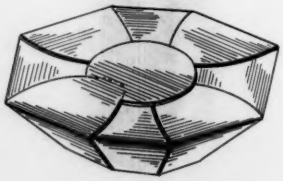


264,310
COMBINED BOTTLE AND CAP
Donald V. R. Thompson, New York, N.Y., assignor to Newburgh Cosmetic Packaging Corp., Newburgh, N.Y.
Filed Sep. 27, 1979, Ser. No. 79,388
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—377

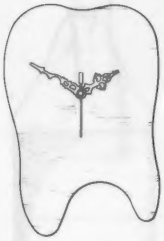
264,311
COMBINED BOTTLE AND CAP
Donald V. R. Thompson, New York, N.Y., assignor to Newburgh Manufacturing Corporation, Newburgh, N.Y.
Filed Jul. 12, 1979, Ser. No. 56,965
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—410

264,312
BOTTLE OR SIMILAR ARTICLE
Salvatore Ruriani, Elmira, N.Y., assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 5, 1979, Ser. No. 27,228
The portion of the term of this patent subsequent to Mar. 29, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—412

264,313
CONTAINER
John J. Austin, La Grange, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Jan. 22, 1980, Ser. No. 114,324
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—416

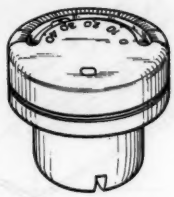


264,314
SIMULATIVE CLOCK
Ronald W. Loerop, Glen Ellyn, Ill., assignor to Loerop, Inc., Glen Ellyn, Ill.
Filed Jun. 5, 1980, Ser. No. 156,770
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D10—6

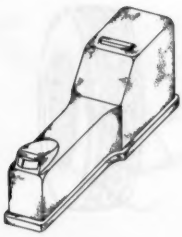


264,315
CLOCK
Dorothy R. White, P.O. Box 763, 931 Mary, Grants Pass, Oreg. 97526
Filed Jun. 2, 1980, Ser. No. 155,858
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—25

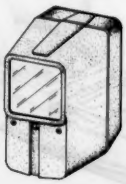
264,316
STEAM EXHAUST VALVE WITH TIMER FOR PRESSURE COOKERS
Bernard Loiseau, Dijon, France, assignor to SEB, Selongey, France
Filed Feb. 1, 1980, Ser. No. 117,481
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



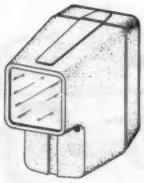
264,317
MICROWAVE RADIATION LEAKAGE DETECTION INSTRUMENT
Herbert D. Tanzman, 325 Norgrove Pl., P.O. Box 2099, Long Branch, N.J. 07740
Filed Jun. 4, 1979, Ser. No. 44,861
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—47



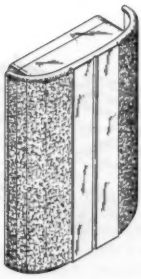
264,318
INFRARED INTRUSION DETECTION SYSTEM HOUSING
John K. Guscott, Lynnfield, and H. Patrick Thornton, Acton, both of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Dec. 12, 1979, Ser. No. 102,734
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



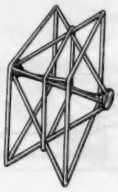
264,319
INFRARED INTRUSION DETECTION SYSTEM HOUSING
John K. Guscott, Lynnfield, and H. Patrick Thornton, Acton, both of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Dec. 12, 1979, Ser. No. 102,771
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



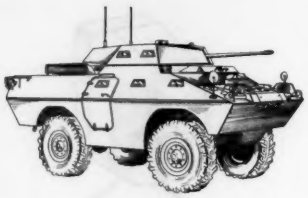
264,320
WALL CHIME
John Doggart, Macclesfield, England, assignor to V & E Friedland Limited, England
Filed Sep. 27, 1979, Ser. No. 79,492
Claims priority, application United Kingdom, Feb. 12, 1979, 79988532
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—118



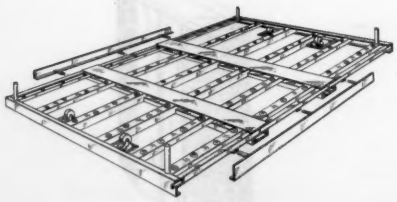
264,321
SYMMETRICALLY INTERFITTING FRAME
Allen M. Kratz, 5400 N.W. 159 St., Miami, Fla. 33014
Filed Jul. 2, 1979, Ser. No. 54,038
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—96



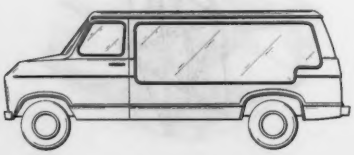
264,322
COMBINED ARMORED VEHICLE AND GUN TURRET
James C. LeBlanc, Mt. Clemens, Mich., assignor to Standard Forge & Axle Company, Inc., Montgomery, Ala.
Continuation of Ser. No. 927,598, Jul. 21, 1978, abandoned. This application Nov. 5, 1980, Ser. No. 204,285
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



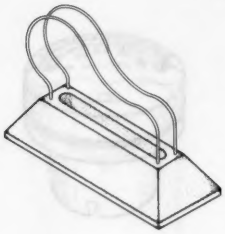
264,323
PALLET
Claes Nordström, Sigvard Grubbesgatan 12, S-230 40 Bara, Sweden
Filed Jan. 15, 1980, Ser. No. 112,182
Claims priority, application Sweden, Jul. 19, 1979, 1681
Term of patent 14 years
Int. Cl. D09—*08*
U.S. Cl. D34—38



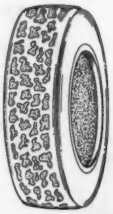
264,324
VAN
Darwin B. Cole, 310 W. Richey, Houston, Tex. 77090
Filed Nov. 9, 1979, Ser. No. 92,749
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—99



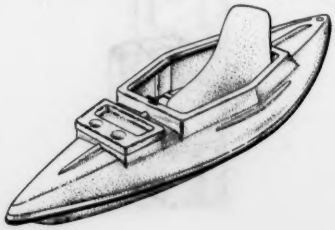
264,325
BICYCLE RACK
Wayne Griswold, 914 Screenland Dr., Burbank, Calif. 91505
Filed Jan. 31, 1980, Ser. No. 117,852
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D12—115



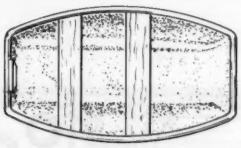
264,326
TIRE
Harry Zimmerman, 5941 Lemona Ave., Van Nuys, Calif. 91411
Filed Aug. 27, 1979, Ser. No. 69,812
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136



264,327
FISHING KAYAK
Halm C. King, Jr., P.O. Box 149, Del Rio, Tex. 78840
Filed Oct. 1, 1979, Ser. No. 80,404
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—302



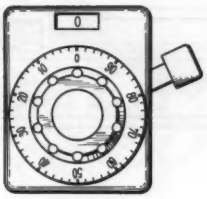
264,328
DINGHY
Robert C. Manthei, 2689 Narcissus Dr., San Diego, Calif. 92106
Filed Mar. 8, 1979, Ser. No. 18,657
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—316



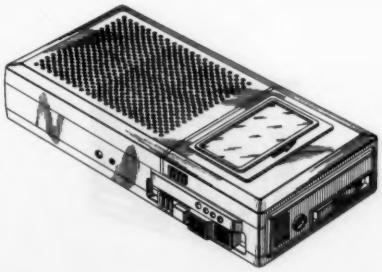
264,329
HELICOPTER BODY
Edward G. Folks, 230 Adelphia, San Antonio, Tex. 78214
Filed Feb. 2, 1979, Ser. No. 9,242
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—327

264,330
FLEXIBLE STRIP PLUG
Donald D. Dumoulin, 5317 Eicher Dr., Fort Wayne, Ind. 46815
Filed Jan. 31, 1980, Ser. No. 117,276
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—28

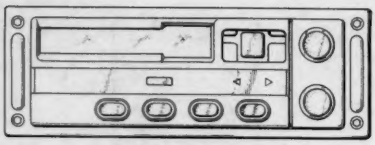
264,331
DIAL FOR USE WITH ELECTRONIC INSTRUMENTS
Eitaro Shimoda, 322, Ichinotsubo, Nakahara-ku, Kawasaki-shi, Kanagawa-ken, Japan
Filed Aug. 24, 1977, Ser. No. 827,384
Claims priority, application Japan, Mar. 22, 1977, 52-10344
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

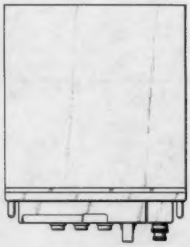


264,332
MICRO CASSETTE TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE
Takuro Nakayama, Tokyo, Japan, assignor to General Electric Company, New York, N.Y.
Filed Jan. 18, 1980, Ser. No. 113,200
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—06

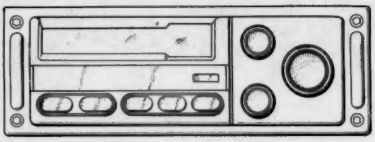


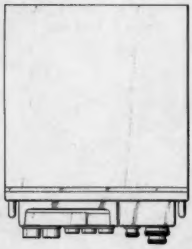
264,333
AUTOMOBILE CASSETTE PLAYER
Toshiyuki Hisatsune, Soka, Japan, assignor to Clarion Co. Ltd., Tokyo, Japan
Filed Oct. 29, 1979, Ser. No. 88,940
Claims priority, application Japan, May 2, 1979, 18037
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—7





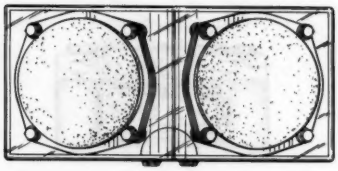
264,334
MOTOR VEHICULAR CASSETTE PLAYER
Toshiyuki Hisatsune, Soka, Japan, assignor to Clarion Co. Ltd., Tokyo, Japan
Filed Oct. 29, 1979, Ser. No. 89,110
Claims priority, application Japan, May 2, 1979, 18038
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—7

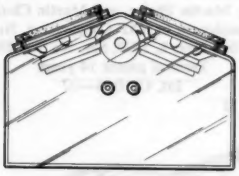




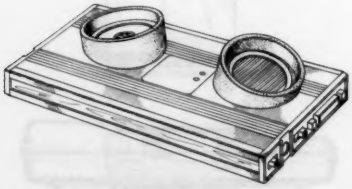
264,335
ORNAMENTAL DESIGN FOR A MICROPHONE
Robert R. Huntington, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed Mar. 6, 1980, Ser. No. 127,927
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—12

264,336
LOUD SPEAKER
William J. Nicholson, and Lawrence F. Farris, both of Jackson County, Mo., assignors to Plastic Design and Fabrication, Inc., Kansas City, Mo.
Filed May 12, 1980, Ser. No. 148,706
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34

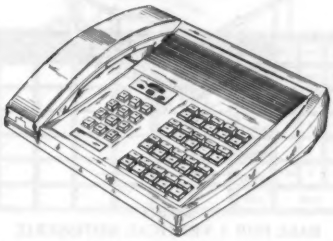




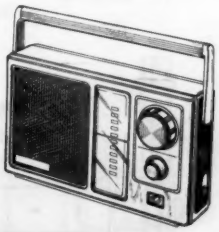
264,337
ACOUSTIC MODEM
Bayard F. Kessler, Woodland Hills, Calif., assignor to Novation, Inc., Tarzana, Calif.
Filed Mar. 17, 1980, Ser. No. 130,973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57



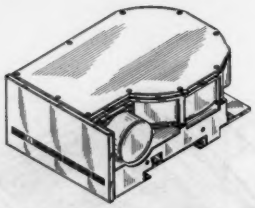
264,338
TELEPHONE INSTRUMENT
James M. Sharp, and Daniel H. Christian, both of Corinth, Miss., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Feb. 19, 1980, Ser. No. 122,790
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58



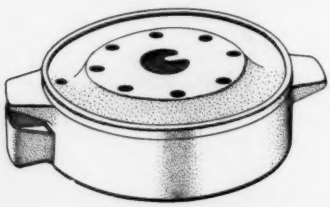
264,339
RADIO RECEIVER
Teruyuki Nishimoto, Hirakata; Takao Okada, Kyoto, and Kenzo Ishise, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 9, 1980, Ser. No. 157,611
Claims priority, application Japan, Dec. 20, 1979, 54-53696
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



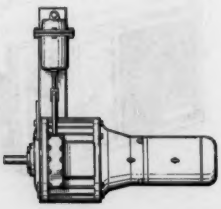
264,340
DISC DRIVE ASSEMBLY
Syed H. Iftikar, Fremont; David L. Reeck, San Jose, and Alan F. Shugart, Aptos, all of Calif., assignors to Shugart Technology, Scotts Valley, Calif.
Filed Apr. 11, 1980, Ser. No. 139,426
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—109



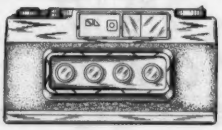
264,341
BASE FOR A VERTICAL ROTISSERIE
Robert A. Williams, and Marshall B. Johnson, both of Chillicothe, Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio
Filed Mar. 13, 1980, Ser. No. 131,467
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—106



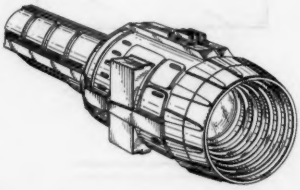
264,342
SPEED CONTROL MECHANISM
Michael W. Johannes, Jordan, Minn., assignor to Owens Service Corporation, Minneapolis, Minn.
Filed Feb. 4, 1980, Ser. No. 118,200
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—149



264,343
MULTIPLE LENS CAMERA
Francis Y. W. Che, Duluth, Ga., assignor to Nimslo Technology, Inc., Atlanta, Ga.
Filed Mar. 10, 1980, Ser. No. 129,128
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—7

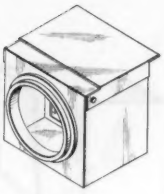


264,344
HAND HELD TRANSPARENCY PROJECTOR
Paul D. Miller; Martin Thaler, and Martin Clarke, all of New York, N.Y., assignors to GAF Corporation, New York, N.Y.
Filed Nov. 5, 1979, Ser. No. 91,359
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—11

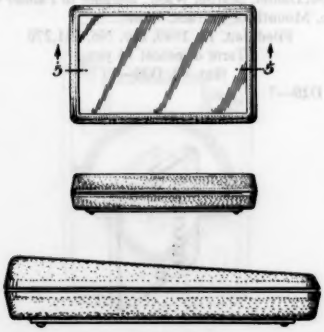


264,345
ELECTROPHOTOGRAPHIC APPARATUS
Nobuo Masaki, Tokyo, and Tateki Nagaoka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 20, 1979, Ser. No. 96,234
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31

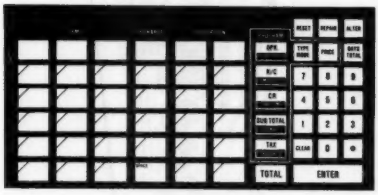
264,346
MATTE BOX ATTACHMENT FOR CAMERAS
Roderick W. Gunn, 14826 Archwood St., Van Nuys, Calif. 91405
Filed Mar. 24, 1980, Ser. No. 133,579
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—38



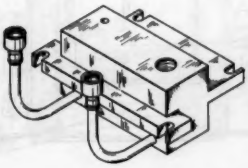
264,347
READILY DISASSEMBLED INSTRUMENT HOUSING
Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.
Filed Mar. 26, 1979, Ser. No. 24,061
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—11



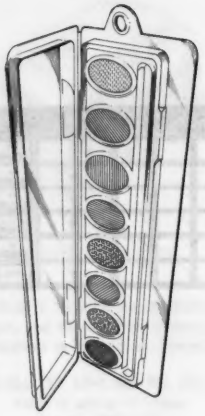
264,348
CONTROL PANEL FOR A COMBINED CASH REGISTER AND CALCULATOR
George H. Turk, Farmers Branch; Ben E. Short, Rockwall, and Gordon Mahon, Lubbock, all of Tex., assignors to Electro Mark Corporation, Dallas, Tex.
Filed Aug. 13, 1979, Ser. No. 66,248
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—12



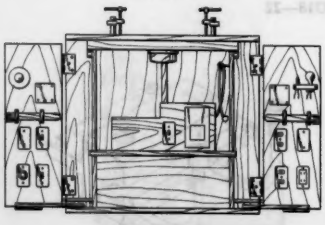
264,349
INK JET PRINT HEAD MODULE
David A. Huliba, Kettering, and Lonnie P. Robinson, Dayton, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed Jul. 3, 1980, Ser. No. 165,594
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—22



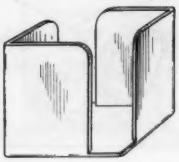
264,350
PAINT BOX KIT
Kenneth G. Jacobsen, 600 Storle Ave., Burlington, Wis. 53105
Filed Jan. 21, 1980, Ser. No. 113,484
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—35



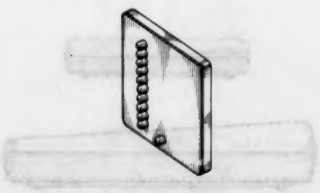
264,351
ELECTRICAL WIRING TRAINER
Matthew Dresens, 287 Alder Rd., Westwood, Mass. 02090
Filed Jul. 24, 1980, Ser. No. 171,750
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



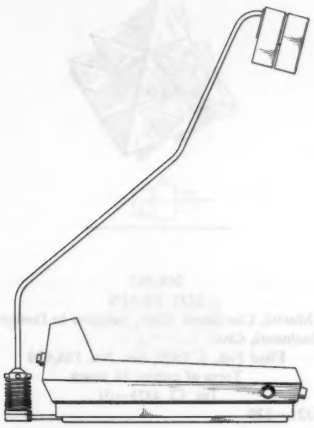
264,352
RECEPTACLE FOR STACKING SHEET MATERIAL
Maurice Goutchat, 7 Grande Rue, Thiverval 77850, France
Filed Jan. 18, 1979, Ser. No. 4,513
Claims priority, application France, Oct. 23, 1978, 78-276
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



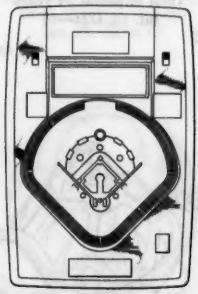
264,353
ELECTRONIC INDICATOR BOARD FOR GUM-DISPENSING MACHINES
John C. McDaniel, Seattle, Wash., assignor to Palmer Company Seattle, Mountlake Terrace, Wash.
Filed Jan. 11, 1980, Ser. No. 111,270
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—7



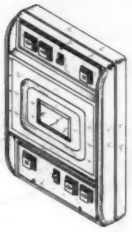
264,354
COMBINED LIGHT AND BALL GAME HOUSING
Joel S. Heinrich, La Canada Flintridge, and R. Bruce Stewart, Pasadena, both of Calif., assignors to Micropin Corporation, Pasadena, Calif.
Filed Jan. 31, 1980, Ser. No. 117,349
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—8



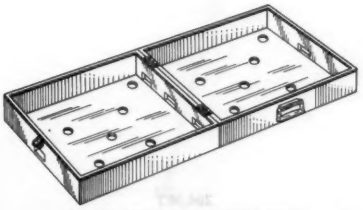
264,355
ELECTRONIC HAND-HELD BASEBALL GAME HOUSING OR THE LIKE
Tsuneo Hanzawa, Tokyo, Japan, assignor to Entex Industries, Inc., Compton, Calif.
Filed Feb. 4, 1980, Ser. No. 117,998
Claims priority, application Japan, Dec. 26, 1979, 54-55232
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



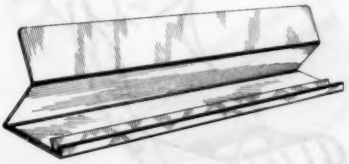
264,356
ELECTRONIC GAME HOUSING
Dietmar Nagel, Chester, N.J., assignor to Nagel-Kennedy & Associates, New York, N.Y.
Filed Feb. 11, 1980, Ser. No. 120,561
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



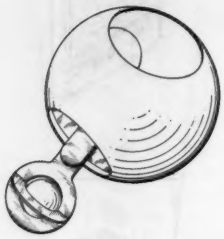
264,357
COMBINED HOCKEY AND GOLF GAME BOARD
Francis R. Martin, 142 Smith St., Lowell, Mass. 01851
Filed Mar. 14, 1980, Ser. No. 130,552
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—15



264,358
PLAYING CARD HOLDER
Robert C. Welteroth, 123 Bay Ave., Highland, N.J. 07732
Filed Mar. 3, 1980, Ser. No. 126,921
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—54

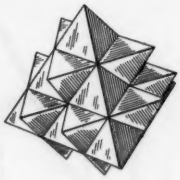


264,359
RATTLE BALL AND HANDLING TOY
Lawrence B. Grubb, Monkton; Danny E. Simpson, Baltimore, both of Md.; Louis S. Hoffman, Morristown, N.J., and David M. Williams, Montreal, Canada, assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed May 30, 1980, Ser. No. 96,258
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—65

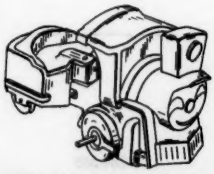


264,360
CHILDREN'S ROCKER SLIDE
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Apr. 18, 1980, Ser. No. 141,307
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D21—66

264,361
PUZZLE TOY
Uwe Meffert, C7, 21st Floor, Elizabeth House, Gloucester Rd., Causeway Bay, Hong Kong
Filed Jun. 4, 1981, Ser. No. 270,537
Claims priority, application Australia, Apr. 1, 1981, 83,789
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—107



264,362
TOY TRAIN
James F. Mariol, Cincinnati, Ohio, assignor to Design Alliance, Inc., Cincinnati, Ohio
Filed Feb. 4, 1980, Ser. No. 118,430
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—129



264,363
TURTLE TOY
Kazue Kudo, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 28, 1980, Ser. No. 115,987
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—157

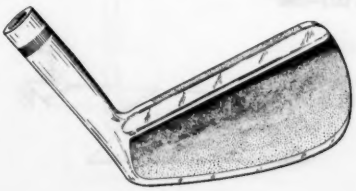
264,364
ILLUMINATED BALL OR THE LIKE
William P. Pazurek, 5634 El Canon, Woodland Hills, Calif. 91367
Filed Oct. 23, 1978, Ser. No. 953,570
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—204

264,365
BALL
Jose L. B. Arino, Barcelona, Spain, assignor to Legar, S.A., Spain
Filed Nov. 29, 1979, Ser. No. 98,342
Claims priority, application Spain, Apr. 6, 1979, 94.384
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—205

264,366
GOLF PUTTER HEAD
Richard J. Roskopf, Beaverton, and John J. Stobie, Portland, both of Oreg., assignors to Roskopf and Stobie Golf Co., Portland, Oreg.
Filed Apr. 30, 1980, Ser. No. 145,580
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

264,367
PUTTER
Walter L. Gida, 1070 Third St., North Versailles, Pa. 15137
Division of Ser. No. 861,163, Dec. 16, 1977, which is a continuation-in-part of Ser. No. 810,774, Jun. 24, 1977, abandoned. This application Sep. 11, 1979, Ser. No. 74,410
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—218

264,368
GOLF IRON HEAD
Eddy G. Van Dyke, and Eugene L. Sheeley, both of Ft. Worth, Tex., assignors to AMF Incorporated, White Plains, N.Y.
Filed Apr. 28, 1980, Ser. No. 143,622
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220



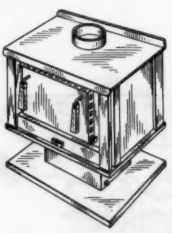
264,369
DIVOT REPAIR TOOL
Albert P. Jackson, 6521 Washington, Windsor Heights, Iowa 50322
Filed Jul. 28, 1980, Ser. No. 173,041
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

264,370
AQUATIC AID
Kevin I. McCarthy, 734 St. James Pl., Newport Beach, Calif. 92663
Filed Aug. 20, 1979, Ser. No. 68,187
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—237

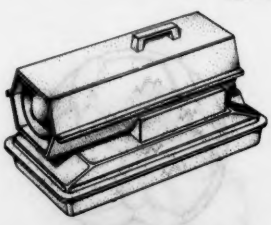
264,371
ROLLING WHEEL TOY
Melvin R. Andrews, Rte. 1, Box 303-A3, Corvallis, Oreg. 97330
Filed Dec. 31, 1979, Ser. No. 108,544
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—240

264,372
INFANT'S TOILET CHAIR
Ronald E. Sachs, 54664 Suburban Dr., Elkhart, Ind. 46514
Filed May 27, 1980, Ser. No. 153,199
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—53

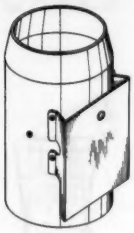
264,373
WOODSTOVE
Joseph G. Chamberlain, 12350 SW. 124th, Tigard, Oreg. 97223
Filed May 16, 1980, Ser. No. 150,311
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



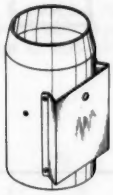
264,374
PORTABLE HEATER
Eugene C. Briggs; Robert F. Shaftner, both of Bowling Green, Ky., and Harry J. Giambrone, Dayton, Ohio, assignors to Koehring Company, Brookfield, Wis.
Filed Jul. 9, 1979, Ser. No. 56,058
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—123



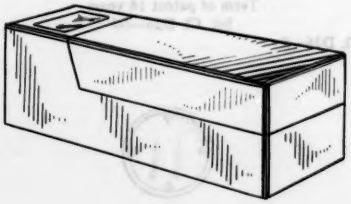
264,375
DAMPER
John Prikkel, III, 2952 Ensley Ave., Dayton, Ohio 45414
Filed Oct. 17, 1979, Ser. No. 85,479
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



264,376
DAMPER
John Prikkel, III, 2952 Ensley Ave., Dayton, Ohio 45414
Filed Feb. 19, 1980, Ser. No. 122,355
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127

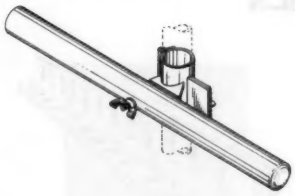


264,377
STERILIZER UNIT CASING
Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Mar. 3, 1980, Ser. No. 126,447
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—9

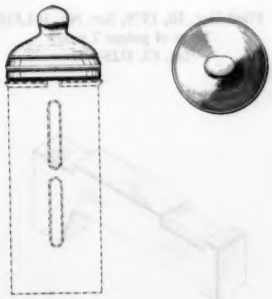


264,378
MEDICAL LANCET
Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Mar. 3, 1980, Ser. No. 126,448
Term of patent 14 years
Int. Cl. D24—*02, 04;* D8—*03*
U.S. Cl. D24—28

264,379
ADJUSTABLE, DETACHABLE HANDLE SUITABLE FOR USE ON WHEELED, HOSPITAL-TYPE IV STANDS AND THE LIKE
Raymond Slinkard, 112 S. Grain, Clearwater, Kans. 67026
Filed Feb. 11, 1980, Ser. No. 120,257
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—29

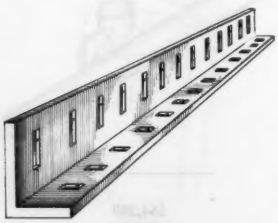


264,380
NIPPLE
Anthony Chrones, Warwick, R.I., assignor to GPC, Inc., Woonsocket, R.I.
Filed Mar. 12, 1979, Ser. No. 19,459
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—46

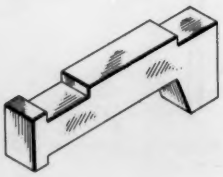


264,381
MENSTRUAL TAMPON
Kerstin A. H. Strandberg, and Leif U. R. Widlund, both of Molnlycke, Sweden, assignors to Molnlycke AB, Gothenburg, Sweden
Filed Apr. 17, 1979, Ser. No. 30,827
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—59

264,382
FOUNDATION BEAM
Sven J. Ankarswed, Vesteras, Sweden, assignor to Ankarswedshus AB Vasteras, Sweden
Filed Jan. 29, 1979, Ser. No. 7,452
Claims priority, application Sweden, Aug. 16, 1978, 781883
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—78



264,383
INTERLOCK CRIB
Hugh G. Campbell, 1846 S. 12th East, Salt Lake City, Utah 84105
Filed Dec. 10, 1979, Ser. No. 101,516
Term of patent 7 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



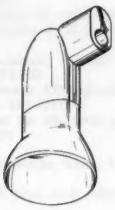
264,384
CANDLESTICK
Timo Sarpaneva, Helsinki, Finland, assignor to A.Ahlstrom Osakeyhtio, Noormarkku, Finland
Filed Nov. 9, 1979, Ser. No. 92,758
Claims priority, application Finland, May 18, 1979, 330/79
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D26—9

264,385
CANDLE HOLDER
Gene Meyer, 12 Quay Ct., Centerport, N.Y. 11721
Filed Dec. 18, 1979, Ser. No. 104,955
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—9

264,386
SPOTLIGHT FITTING

Robert Heritage, 12 Jay Mews, Kensington Gore, London SW7 2EP, England, and Stephen Hall, 30 Crawford St., London W.1, England

Filed Jun. 14, 1979, Ser. No. 48,678
Claims priority, application United Kingdom, Jan. 25, 1979, 988248
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—63



264,387
LIGHTED AND FOLDABLE HAND MIRROR

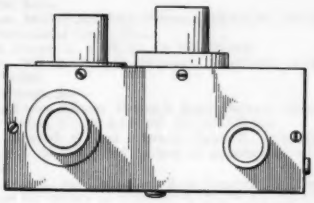
Raymond Boyd, 2235 Cambridge Rd., Broomall, Pa. 19008

Filed Jul. 5, 1979, Ser. No. 55,023
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—67

264,388
VALVED MANIFOLD FOR SEMI-OPEN, NON-REBREATHING ANESTHESIA

Gale E. Dryden, 5835 N. Tacoma Ave., Indianapolis, Ind. 46220

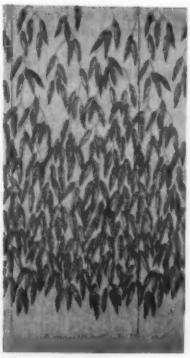
Filed Mar. 21, 1980, Ser. No. 131,930
Term of patent 14 years
Int. Cl. D29—*02;* D23—*01*
U.S. Cl. D29—7



264,389
CURTAIN MATERIAL

Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland

Filed Jan. 23, 1980, Ser. No. 114,581
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 813
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 K



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TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF MAY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Roth, Claris D.; Moser, Kenneth B.; and Bomball, William A., 4,329,449, Cl. 536-18.600.

A/S Haustrups Fabriker: *See*—
Johansen, Aage M.; and Ronold, Olav A., deceased, 4,329,380, Cl. 427-236.000.

Acroform Corporation: *See*—
Miller, Jack V., 4,328,848, Cl. 145-33.00R.

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Adamski, Gunter: *See*—
Madge, Joachim; Adamski, Gunter; and Prochnow, Claus, 4,329,041, Cl. 354-293.000.

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Richter, Henning; and Brocks, Klaus, 4,328,858, Cl. 165-45.000.

Affel, John J.: *See*—
Kavli, Fred; Park, Kyong; and Affel, John J., 4,329,732, Cl. 361-283.000.

Affiliated Hospital Products, Inc.: *See*—
Ganz, Rudolph V., 4,329,312, Cl. 264-306.000.

Agence Nationale de Valorisation de la Recherche: *See*—
Clement, Michel; and Alais, Pierre, 4,328,707, Cl. 73-618.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Massart, Rene, 4,329,241, Cl. 252-62.520.

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Stievenart, Emile F.; Plessers, Hendrik S.; Hellemans, Julianus J.; and Neujens, Georges J., 4,329,589, Cl. 250-468.000.

Ahad, Munir J., to American Safety Equipment Corp. Self-aligning inertia sensor assembly. 4,328,934, Cl. 242-107.40A.

Ahlen, Karl G.; and Bergstrom, Per-Olof, to S.R.M. Hydromekanik Aktiebolag. Multi-speed planetary gear. 4,328,716, Cl. 74-760.000.

Ahne, Hellmut: *See*—
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, 4,329,556, Cl. 548-549.000.

Aiba, Masahiko, to Sharp Kabushiki Kaisha. Charge timing evaluation in an ink jet system printer of the charge amplitude controlling type. 4,329,695, Cl. 346-75.000.

Aihara, Mamoru; Takahashi, Yutaka; Nakajima, Yoshio; and Matsuura, Tsuyoshi, to Olympus Optical Company, Ltd. Integrating time detector for photographic apparatus. 4,329,030, Cl. 354-23.00D.

Aiki, Kunio: *See*—
Doi, Atsutoshi; Aiki, Kunio; Chinone, Naoki; Nakamura, Satoshi; and Ito, Ryoichi, 4,329,658, Cl. 372-45.000.

Ainsworth, Anthony T.; and Smith, David G., to Beecham Group Limited. 3-Chlorophenyl anti-obesity agents. 4,329,358, Cl. 424-309.000.

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Dalton, Augustine I., Jr.; and Skinner, Ronald W., 4,329,321, Cl. 423-22.000.
Milligan, Barton; and Grandin, Roland E., 4,329,501, Cl. 564-305.000.
Sircar, Shivaji, 4,329,158, Cl. 55-26.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Inada, Masami; Kitamura, Kazuhiko; Okumura, Shuji; Nonoyama, Takao; and Tsuji, Riichi, 4,328,832, Cl. 137-625.460.
Kawabata, Yasuhiro; and Shibata, Noriyoshi, 4,329,123, Cl. 417-393.000.

Akers, Roy, to Bell & Howell Company. Mail sorting machine. 4,328,962, Cl. 271-12.000.

Akita, Sigeyuki; and Kitagawa, Junji, to Nippon Soken, Inc. Tachometer suitable for use in engine maintenance. 4,328,706, Cl. 73-493.000.

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Akopov, Ernest M.; and Postolov, Petr M. Method of suturing the organs of the gastrointestinal tract. 4,328,805, Cl. 128-334.00R.

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Jander, Ulf, 4,328,752, Cl. 102-257.000.

Akzona Incorporated: *See*—
Bronner, Juergen, 4,329,392, Cl. 428-296.000.
Tax, Lambert J. W. M., 4,329,296, Cl. 260-397.400.

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Bolton, Joseph A., 4,329,201, Cl. 162-198.000.
Coplan, Myron J.; and Bilewski, Friedhelm, 4,328,730, Cl. 83-581.000.

Alberts, Heinrich: *See*—
Riebel, Klaus; Alberts, Heinrich; Bartl, Herbert; Mietzsch, Fritz; and Steffen, Ulrich, 4,329,267, Cl. 523-323.000.

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Alford, Harvey E.; and Chan, Keng S., to Standard Oil Company, The. Technique for tertiary oil recovery. 4,329,236, Cl. 252-8.55D.

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Allegre, Jean; Merouge, Gilbert; and Ruelle, Gilbert, to Alsthom Atlantique. Rotor with a damper screen for an alternator with projecting poles. 4,329,609, Cl. 310-183.000.

Allen, Johnnie D. Progressive shotshell reloading. 4,328,735, Cl. 86-36.000.

Allied Chemical Corporation: *See*—
Harris, Paul W., 4,329,147, Cl. 8-636.000.
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Demmin, Timothy R.; and Rogic, Milorad M., 4,329,498, Cl. 562-553.000.

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Bouplon, Edward J., 4,329,077, Cl. 403-287.000.

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Allison, Richard: *See*—
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Takeda, Toshio; Amano, Takehisa; Isii, Sigeki; and Hamada, Seiya, 4,328,732, Cl. 84-1.170.

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American Cyanamid Company: *See*—
Lang, Stanley A., Jr.; Lin, Yang-i; and Ridge, David N., 4,329,463, Cl. 544-405.000.
Montgomery, Carroll S., 4,329,494, Cl. 562-425.000.

American Hoechst Corporation: *See*—
Westcott, Robert F.; and Delamater, John R., 4,329,307, Cl. 264-160.000.

American Hospital Supply Corporation: *See*—
Cooper, Robert P., 4,328,806, Cl. 128-349.00B.

American Microsystems, Inc.: *See*—
Gregorian, Roubik; and Suzuki, Toshiro, 4,329,599, Cl. 307-520.000.

American Safety Equipment Corp.: *See*—
Ahad, Munir J., 4,328,934, Cl. 242-107.40A.

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Nelson, David H., 4,328,789, Cl. 126-425.000.

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Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,329,033, Cl. 354-25.000.

Amsted-Siemag Kette GmbH: *See*—
Taubert, Klaus; Wehler, Herbert; and Bald, Alfred, 4,328,665, Cl. 59-88.000.

An-Nen, Yoshiaki: *See*—
Taniguchi, Katsuo; Takahata, Kazunori; and An-Nen, Yoshiaki, 4,329,517, Cl. 568-804.000.

Andco Actuator Products, Inc.: *See*—
Zouzoulas, John, 4,328,885, Cl. 192-142.00R.
Anderle, Joseph A., to Levolor Lorentzen, Inc. Ceiling panel clip. 4,328,653, Cl. 52-460.000.
Anderson, Clifton W.: *See*—
Buschbom, Floyd E.; Hansen, Glen D.; Paulson, Jerome T.; and Anderson, Clifton W., 4,329,105, Cl. 414-316.000.
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., to Merck & Co., Inc. Dibenzo[a,d]cycloocten-6,12-imines. 4,329,465, Cl. 546-072.000.
Andersson, Per-Erik; and Eriksson, Fall E. I., to SCA Development Aktiebolag. Process for digesting and bleaching cellulosic material with reduced emissions. 4,329,199, Cl. 162-19.000.
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Ando, Akio: *See*—
Inouye, Yoshinori; Ando, Akio; and Nakahashi, Ryuichi, 4,328,749, Cl. 101-426.000.
Andoh, Naoki; Nishiwaki, Itsuo; and Arakawa, Masatoshi. Process for production of methacrylic acid esters. 4,329,492, Cl. 560-205.000.
Andrew, Sydney P. S., to Imperial Chemical Industries Limited. Gas analysis. 4,328,780, Cl. 123-440.000.
Angi, Donald F.; and Cornwell, William D., Jr., to General Motors Corporation. Electric motor having radio frequency interference radiation suppression. 4,329,605, Cl. 310-68.00R.
Ansen, Jakob: *See*—
Herchenbach, Horst; and Ansen, Jakob, 4,329,180, Cl. 106-100.000.
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Aoki, Harumi; and Sawada, Yoshio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focus indicating device for camera. 4,329,032, Cl. 354-25.000.
Aoki, Kenji: *See*—
Ikeda, Masayuki; and Aoki, Kenji, 4,329,641, Cl. 324-115.000.
Aoki, Tomohiro: *See*—
Kitajima, Tadayuki; Kasamura, Toshirou; Aoki, Tomohiro; Takeoka, Yoshihiko; and Namekata, Kiyokazu, 4,329,044, Cl. 355-15.000.
Aoshima, Atsushi; Mitsui, Ryoichi; and Kaneko, Toshiaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for dehydration of unsaturated aldehyde-containing gas. 4,329,513, Cl. 568-492.000.
Applegate, Steven L.; and Dyer, Stanley, to International Business Machines Corporation. Current collector for resistive ribbon printers. 4,329,071, Cl. 400-120.000.
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Arai, Hajime, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic transmission. 4,328,717, Cl. 74-760.000.
Arakawa, Masatoshi: *See*—
Andoh, Naoki; Nishiwaki, Itsuo; and Arakawa, Masatoshi, 4,329,492, Cl. 560-205.000.
Arkans, Edward J., to Kendall Company, The. Precordial ECG strip. 4,328,814, Cl. 128-640.000.
Arman S.p.A.: *See*—
Maiocco, Guiseppe, 4,328,688, Cl. 70-252.000.
Armstrong Cork Company: *See*—
Wisnosky, Jerome D.; and Cauler, Caroline A., 4,329,421, Cl. 430-322.000.
Arnason, Sigurdur I.; and Kleese, Edward J., to General Tire & Rubber Company, The. In-the-mold coating apparatus and method. 4,329,134, Cl. 425-157.000.
Arner, Ralph B.: *See*—
Desrosiers, J. Armand; and Arner, Ralph B., 4,328,658, Cl. 56-8.000.
Arpasi, Miklos; and Rakar, Geza, to Orszagos Koolaj es Gazipari Troszt. Apparatus for measuring the deformation and stress condition of the string of casing of drilled oil wells. 4,328,704, Cl. 73-151.000.
Arvanitis, Aristotelis S., to Motorola, Inc. Two-pole monolithic crystal filter. 4,329,666, Cl. 333-191.000.
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Zang, Robert, 4,328,928, Cl. 242-18.0DD.
Asada, Kosaku; and Maeno, Hiroo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Thick and tough cellophane for casings and method of preparing the same. 4,328,838, Cl. 138-118.100.
Asagao, Soichi; Nakatani, Masaru; Nakagawa, Shinsuke; Takahara, Yoshiyuki; and Okada, Naoki, to Central Glass Company, Limited. Process for preparing crystalline ammonium dihydrogen phosphate. 4,329,326, Cl. 423-308.000.
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Aoshima, Atsushi; Mitsui, Ryoichi; and Kaneko, Toshiaki, 4,329,513, Cl. 568-492.000.
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,329,434, Cl. 521-27.000.
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,329,435, Cl. 521-38.000.
Tamura, Nobuhiro; Fukuoka, Yohei; Nishikido, Joji; Yamamatsu, Setsuo; and Suzuki, Yoshio, 4,329,462, Cl. 544-387.000.
Yamori, Akio; Saito, Akira; and Morita, Hideo, 4,329,438, Cl. 525-64.000.
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Aoki, Harumi; and Sawada, Yoshio, 4,329,032, Cl. 354-25.000.
Asakura, Masamitsu; Ito, Tomo; and Niida, Chiaki, to Hitachi, Ltd. Device for controlling negative pressure in suction pipe of internal combustion engine. 4,328,774, Cl. 123-327.000.
Asano, Noriyuki; Niwa, Yukichi; Ohwada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, to Canon Kabushiki Kaisha. Focus detecting device with photo-sensor array. 4,329,577, Cl. 250-201.000.
Aspinwall, Ronald A., to Sperry Corporation. Magnetic detent for a control valve. 4,328,950, Cl. 251-297.000.
Astrupgaard, Svend; and Petri, Heinz, to Pfaff Industriemaschinen GmbH. Sewing machine with a stitch setting device. 4,328,759, Cl. 112-316.000.
Ateliers des Charmilles, S.A.: *See*—
Martin, Roland, 4,329,558, Cl. 219-69.00W.
Atlantic Richfield Company: *See*—
Kutta, Helmuth W., 4,329,179, Cl. 106-97.000.
Nelson, Thomas J., 4,329,220, Cl. 208-89.000.
Atlas Powder Company: *See*—
Oswald, Gerald L., 4,328,751, Cl. 102-220.000.
Attridge, Stephen P., to Transcan Video Limited. Apparatus for use in scanning a cinematograph film. 4,329,715, Cl. 358-214.000.
Auerbach, Robert A.: *See*—
Kny, Erich; James, William J.; Levenson, Leonard L.; and Auerbach, Robert A., 4,329,418, Cl. 430-270.000.
Aurther, William B., to Purex Corporation. Multi-ported valve with sealing network between valve body and rotor. 4,328,833, Cl. 137-625.470.
Australian National University, The: *See*—
Ringwood, Alfred E., 4,329,248, Cl. 252-628.000.
Auth, Werner: *See*—
Reiner, Hans; and Auth, Werner, 4,329,640, Cl. 324-73.00R.
Autographic Business Forms, Inc.: *See*—
Lovrich, Vincent; and Sundell, George J., 4,329,572, Cl. 235-92.0EC.
Autologic, S.A.: *See*—
Moyroud, Louis M., 4,329,026, Cl. 354-5.000.
Moyroud, Louis M.; Bongard, Michel; Vernez, Paul A.; and Moulin, Michel, 4,329,027, Cl. 354-5.000.
Avco Corporation: *See*—
Libertini, Zoltan L.; Duly, Alan R.; and White, Steven D., 4,329,644, Cl. 324-160.000.
McClure, John W.; and Hudson, George S., 4,328,703, Cl. 73-117.400.
Averill, Richard R., to Ingersoll-Rand Company. Brushholder. 4,329,612, Cl. 310-247.000.
Avon Products, Inc.: *See*—
Behne, Jurgen, 4,328,896, Cl. 206-497.000.
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Temperature control device for gas turbines. 4,329,113, Cl. 415-116.000.
B. F. Goodrich Company, The: *See*—
Hallenbeck, Victor L., 4,329,265, Cl. 524-496.000.
Murphy, Walter T., 4,329,277, Cl. 523-122.000.
Baars, George J. Weatherproof junction box. 4,328,903, Cl. 220-3.700.
Bachalo, William D., to Spectron Development Laboratories, Inc. Apparatus for sizing particles, droplets or the like with laser scattering. 4,329,054, Cl. 356-336.000.
Backx, Leo: *See*—
Heeres, Jan; Backx, Leo; Van Laerhoven, Willy; and Sturm, Elmar, 4,329,342, Cl. 424-245.000.
Bagley, Melvin R.; Crocker, Burton B.; and Pysz, John F., to Monsanto Company. Chlorination method. 4,329,526, Cl. 570-203.000.
Bagwell, Alan D., to British Steel Corporation. Rotary ultrasonic testing apparatus. 4,328,708, Cl. 73-622.000.
Baisch, Herbert: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Baisch, Herbert, 4,328,728, Cl. 83-471.300.
Baker, Bernard S., to Energy Research Corporation. Electrolyte-electrode assembly for fuel cells. 4,329,403, Cl. 429-35.000.
Baker, Kenneth L.: *See*—
Gonwa, Charles J.; Baker, Kenneth L.; and Sieloff, Ronald A., 4,328,696, Cl. 72-389.000.
Baker, Michael J., to Hawker Siddeley Dynamics Ltd. Phase change warning devices. 4,329,682, Cl. 340-581.000.
Baker Perkins Holdings Ltd.: *See*—
Edwards, Albert, 4,329,063, Cl. 366-34.000.
Baker, Richard H., to Exxon Research & Engineering Co. VMOS/-Bipolar power switching device. 4,329,705, Cl. 357-43.000.
Baker, Richard R.: *See*—
Naylor, Donald B.; and Baker, Richard R., 4,328,817, Cl. 131-360.000.
Balch, Robert A. Electrical terminal connector. 4,329,010, Cl. 339-265.00R.
Bald, Alfred: *See*—
Taubert, Klaus; Wehler, Herbert; and Bald, Alfred, 4,328,665, Cl. 59-88.000.
Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. 2-Substituted propoxy-3-cyano-5-RO-pyridines and intermediates. 4,329,351, Cl. 424-263.000.
Ball Corporation: *See*—
Olsen, Arthur A., 4,329,050, Cl. 356-305.000.
Ballard, Billie E. Automatic two-speed drive system. 4,328,877, Cl. 180-70.00R.
Ballard, Welton R., to Sundstrand Corporation. Directly cooled, rotating rectifier assembly for a synchronous machine. 4,329,603, Cl. 310-61.000.
Balogh, Tibor: *See*—
Szilagyi, Geza; Matyus, Peter; Kasztreiner, Endre; Balogh, Tibor; and Ila, Lajos, 4,329,457, Cl. 544-114.000.

Bangor Punta Corporation: *See*—
Oberg, James L.; Curran, Roger J.; and Czayka, Michael, 4,328,750, Cl. 102-514.000.
Banks, Bruce A.; Weigand, Albert J.; and Sovey, James S., to United States of America, National Aeronautics and Space Administration. Texturing polymer surfaces by transfer casting. 4,329,385, Cl. 428-141.000.
Barakitis, Nikolaos; and Cohen, Sheppard, to GTE Products Corporation. Starter and discharge lamp starting circuit. 4,329,621, Cl. 315-47.000.
Barbee, Jack C.; and Hart, Gene E., to Speizman Industries, Inc. Auxiliary yarn feed finger and pattern drum sleeve for circular knitting machines and method of knitting therewith. 4,328,686, Cl. 66-224.000.
Barber, Donald T., to Datafile Limited. System for alphabetically labelling articles. 4,329,191, Cl. 156-64.000.
Barkow, William H.: *See*—
Gross, Josef; and Barkow, William H., 4,329,671, Cl. 335-213.000.
Barnes, Robert M.: *See*—
Leistra, Philip W., Jr.; and Barnes, Robert M., 4,328,612, Cl. 29-802.000.
Barr, Arthur. Method for the oral treatment of dogs and other animals. 4,329,333, Cl. 424-19.000.
Barrett, Harrison H.; Swindell, William; and Greivenkamp, John E., Jr., to University Patents, Inc. Polarization switched optical filtering for transverse tomography. 4,329,588, Cl. 250-445.00T.
Barry, George H.: *See*—
Dahl, Ernest A.; and Barry, George H., 4,329,406, Cl. 429-92.000.
Barry Herbert Hirschowitz: *See*—
Hirschowitz, Barry H.; and Li, Kwok-Leung, 4,328,809, Cl. 128-653.000.
Bartesaghi, Angelo. Plane die-cutting machine. 4,328,729, Cl. 83-568.000.
Bartl, Herbert: *See*—
Riebel, Klaus; Alberts, Heinrich; Bartl, Herbert; Mietzsch, Fritz; and Steffen, Ulrich, 4,329,267, Cl. 523-323.000.
Bartoli, Cesare M.: *See*—
Valentian, Dominique R.; Bartoli, Cesare M.; Pfeffer, Heinrich A.; Herhudt v. Rohden, Hans-Joachim; and Stewart, Duncan, 4,328,667, Cl. 60-202.000.
BASF Aktiengesellschaft: *See*—
Frickel, Fritz-Frieder; von Philipsborn, Gerda; Mueller, Claus D.; and Lenke, Dieter, 4,329,352, Cl. 424-267.000.
Hansen, Guenter; Kermer, Wolf-Dieter; and Stuck, Jochen-Wilfried, 4,329,148, Cl. 8-639.000.
Krapf, Heinz; Oppenlaender, Knut; and Uhl, Guenter, 4,329,176, Cl. 106-19.000.
Baskin, Joseph M., to Boeing Company, The. Rotor blade internal damper. 4,329,119, Cl. 416-226.000.
Bather, Ringrose, Wolsfeld, Jarvis, Gardner, Inc.: *See*—
Bennett, David J.; and Eijadi, David A., 4,329,021, Cl. 350-259.000.
Bauer, Adolf: *See*—
Kaniss, Normann; and Bauer, Adolf, 4,329,497, Cl. 562-478.000.
Bauer, Wolfgang; and Kuhlein, Klaus, to Cassella Aktiengesellschaft. Process for the preparation of 2-amino-4-nitrophenol. 4,329,503, Cl. 564-418.000.
Baugh, Hollis A., to Koomey, Inc. Underwater fluid connector. 4,328,826, Cl. 137-236.00S.
Baxter Travenol Laboratories, Inc.: *See*—
Bodnar, Bert S.; and Schnell, William J., 4,329,229, Cl. 210-321.200.
Bayer AG: *See*—
Schubart, Rudiger; and Langner, Gunter P., 4,329,477, Cl. 548-305.000.
Bayer Akteingesellschaft: *See*—
Henk, Hermann, 4,329,282, Cl. 260-153.000.
Bayer Aktiengesellschaft: *See*—
Horstmann, Walter; and Hammerstrom, Knut, 4,329,499, Cl. 564-81.000.
Klauke, Erich; Kysela, Ernst; Stuwe, Arnd; and Dorlars, Alfons, 4,329,458, Cl. 544-217.000.
Koll, Jochen; Molls, Hans-Heinz; Hornle, Reinhold; Schuffenhauer, Erhard; Brandt, Horst; Bremer, Fritz; Wolf, Karlheinz; and Schiwy, Willy, 4,329,145, Cl. 8-527.000.
Reel, Henning; and Leverenz, Klaus, 4,329,283, Cl. 260-156.000.
Riebel, Klaus; Alberts, Heinrich; Bartl, Herbert; Mietzsch, Fritz; and Steffen, Ulrich, 4,329,267, Cl. 523-323.000.
Bayerische Motoren Werke A.G.: *See*—
Gartner, Jurij; Hengl, Helmut; Sixt, Karl; and Woltmann, Reinhard, 4,328,854, Cl. 164-369.000.
BBC Brown, Boveri & Company Limited: *See*—
Zumstein, Bruno, 4,328,672, Cl. 60-606.000.
Beach, David L.; Lunden, Richard W.; and Zambelli, Adolfo, to Gulf Research & Development Company. Catalyst composition. 4,329,255, Cl. 252-429.00B.
Beardl, James D.; Nelson, Donald J.; Haller, Kirk J.; and Bowers, Kenneth E., to Ethyl Development Corporation. Unscrambler-unloader. 4,328,887, Cl. 198-396.000.
Beard, Michael J., to Medi-Pack Limited. Dispenser for individual moistened paper tissues from a length therefor perforated at intervals. 4,328,907, Cl. 221-63.000.
Beaumont, Graham J., to Keeton Sons & Co. Ltd. Punch adaptor for folding machine. 4,328,695, Cl. 72-389.000.
Beaumont, Peter W. Outlet tube and method. 4,328,694, Cl. 72-379.000.
Beck, Michel, to Technics Lambda International. Device for the continuous thermal or thermo-chemical treatment of objects by emission of micro-waves. 4,329,135, Cl. 425-174.000.
Becker, Robert W.: *See*—
Merchant, Vijay; Henriksen, Stephen R.; Boucher, R. Wayne; and Dodd, Jerrold J., 4,329,210, Cl. 204-107.000.
Becktel, Robert L.; Greenwell, Robert P.; and Tilling, Basil B., to Parker-Hannifin Corporation. Pressure fueling adapter. 4,328,844, Cl. 141-302.000.
Becton, Dickinson and Company: *See*—
Spritzer, Lawrence; Stetter, Joseph R.; and Rutt, Donald R., 4,329,214, Cl. 204-195.00R.
Beecham Group Limited: *See*—
Ainsworth, Anthony T.; and Smith, David G., 4,329,358, Cl. 424-309.000.
Hadley, Michael S., 4,329,344, Cl. 424-250.000.
Beers, John W. R. Firearm cleaning device. 4,328,632, Cl. 42-1.0BC.
Beert, Frank C.: *See*—
Jirak, Thomas L.; and Beert, Frank C., 4,328,807, Cl. 128-419.0PG.
Begin, John D.: *See*—
Juengel, Richard O.; Begin, John D.; and Khalaf, John, 4,328,623, Cl. 33-174.00L.
Behne, Jurgen, to Avon Products, Inc. Wrapping material and method of forming wrapped package. 4,328,896, Cl. 206-497.000.
Behr, Fred E., to Minnesota Mining and Manufacturing Company. Cyclic perfluoroaliphaticdisulfonic acid anhydrides. 4,329,478, Cl. 549-11.000.
Belanger, Robert L. Tactile measuring device. 4,328,618, Cl. 33-125.00R.
Beldam, Richard P.: *See*—
Cheong, Alex S.; and Beldam, Richard P., 4,328,861, Cl. 165-151.000.
Bell, Alan E., to RCA Corporation. Information record. 4,329,697, Cl. 346-135.100.
Bell, Edward J. Gate assembly. 4,328,643, Cl. 49-381.000.
Bell & Howell Company: *See*—
Akers, Roy, 4,328,962, Cl. 271-12.000.
Bell Telephone Laboratories, Incorporated: *See*—
Chen, Fang-Shang, 4,329,659, Cl. 331-94.550.
Kirkpatrick, Robert J., 4,328,613, Cl. 29-837.000.
Belvedere Company, Inc.: *See*—
Cowen, Theodore A.; and Jackovin, Gary B., 4,329,002, Cl. 312-196.000.
Benjamin, Harry L. Position sensing device. 4,328,621, Cl. 33-174.00L.
Bennett, David E., to Kelley Company Inc. Safety leg construction for a dockboard. 4,328,602, Cl. 14-71.300.
Bennett, David J.; and Eijadi, David A., to Bather, Ringrose, Wolsfeld, Jarvis, Gardner, Inc. Passive solar lighting system. 4,329,021, Cl. 350-259.000.
Bercha, Frank G.: *See*—
O'Rourke, J. Cam; Pilkington, G. Roger; and Bercha, Frank G., 4,328,760, Cl. 114-67.00A.
Bereskin, Alexander B. Back plate mounted lumped element microwave oscillator. 4,329,663, Cl. 331-96.000.
Berg, Howard M.; and Lewis, Gary L., to Motorola, Inc. Process for attaching optical fiber to semiconductor die. 4,329,190, Cl. 156-60.000.
Bergstrom, Per-Olof: *See*—
Ahlen, Karl G.; and Bergstrom, Per-Olof, 4,328,716, Cl. 74-760.000.
Bergthaller, Peter, to AGFA-Gevaert AG Aktiengesellschaft. Process for the polymerization of allyl ammonium salts and the resulting products. 4,329,441, Cl. 526-193.000.
Bergwerksverband GmbH: *See*—
Habermehl, Diethard; and Kucharzyk, Werner, 4,329,141, Cl. 432-17.000.
Bernard, Alfred M.: *See*—
Lauwerys, Robert R.; and Bernard, Alfred M., 4,329,152, Cl. 23-230.00B.
Bernard, Georges; and Leclercq, Pierre, to Merlin Gerin. Alternating current interrupter with magnetic arc extinguishing means. 4,329,551, Cl. 200-147.00R.
Bernhart, Claude; Gagnol, Jean P.; and Gautier, Patrick, to Sanofi. Pyrrole amides and therapeutic use thereof. 4,329,343, Cl. 424-248.540.
Berry, Kay L., to Standard Oil Company (Indiana). In situ retorting of oil shale. 4,328,863, Cl. 166-261.000.
Besi, Mario: *See*—
Montesi, Vittorio; and Besi, Mario, 4,329,546, Cl. 179-81.00R.
Betsch, Helmut; Goertler, Horst; Liedtke, Karl-Heinz; Prohaska, Hans; and Rachner, Horst, to ITT Industries Incorporated. Wiper installation for motor vehicles. 4,329,631, Cl. 318-466.000.
Betz, Laboratories, Inc.: *See*—
Vogt, Frederick G., deceased; and Sparrell, Patricia T., 4,329,250, Cl. 252-389.00R.
BFG Glassgroup: *See*—
Terneu, Robert; and Van Cauter, Albert, 4,329,379, Cl. 427-166.000.
Bilewski, Friedhelm: *See*—
Coplan, Myron J.; and Bilewski, Friedhelm, 4,328,730, Cl. 83-581.000.
Bindra, Jasjit S., to Pfizer Inc. Enkephalinase enzyme inhibiting compounds. 4,329,495, Cl. 562-426.000.
Biodata S.p.A.: *See*—
Ricci, Giorgio; and Federici, Giorgio, 4,329,425, Cl. 435-16.000.
Birnbaum, Betty. Display pedestal. 4,328,942, Cl. 248-558.000.
Birnbreier, Hermann: *See*—
Gross, Franz; and Birnbreier, Hermann, 4,329,407, Cl. 429-101.000.

Biron, Raymond J.: *See—*
Saunders, Peter R.; and Biron, Raymond J., 4,329,489, Cl. 560-79.000.

Bishai, Macram N., to General Motors Corporation. Fuel tank water drain system. 4,328,825, Cl. 137-172.000.

Black & Decker Inc.: *See—*
Klein, Henry, 4,329,610, Cl. 310-220.000.

Bliek, David C.: *See—*
Rees, James D.; Simpson, George R.; and Bliek, David C., 4,329,045, Cl. 355-67.000.

Blount, David H. Process for the production of broken down lignin-cellulose silicate copolymers. 4,329,437, Cl. 521-100.000.

Blytas, George C.: *See—*
van Aken, Andreas B.; Blytas, George C.; and Visser, Rene M., 4,329,233, Cl. 210-673.000.

Board of Reagents, University of Washington: *See—*
Sarkanen, Kyosti V., 4,329,200, Cl. 162-77.000.

Board of Regents, The University of Texas System: *See—*
Hanahan, Donald J.; and Pinckard, R. Neal, 4,329,302, Cl. 260-925.000.

BOC Limited: *See—*
Dyer, Anthony O., 4,329,142, Cl. 432-19.000.

Bochan, John, to General Electric Company. Washing machine. 4,328,600, Cl. 8-159.000.

Bodenseewerk Geratetechnik GmbH: *See—*
Jansen, Dirk; and Keller, Friedrich, 4,329,579, Cl. 250-203.00R.

Bodin, Boris G. R., to Ifo Sanitar AB. Adjustable wash-basin. 4,328,597, Cl. 4-644.000.

Bodnar, Bert S.; and Schnell, William J., to Baxter Travenol Laboratories, Inc. Method of potting the ends of a bundle of hollow fibers positioned in a casing. 4,329,229, Cl. 210-321.200.

Boehringer Ingelheim GmbH: *See—*
Jardillier, Jean-Claude; Carpentier, Yves; and Desoize, Bernard, 4,329,346, Cl. 424-251.000.
Muller, Erich; Nickl, Josef; Roch, Josef; Narr, Berthold; Haarmann, Walter; and Weisenberger, Johannes M., 4,329,347, Cl. 424-251.000.

Boehringer Mannheim GmbH: *See—*
Haar, Hans-Peter; Edelmann, Hermann; and Klose, Sigmar, 4,329,062, Cl. 356-414.000.

Boeing Company, The: *See—*
Baskin, Joseph M., 4,329,119, Cl. 416-226.000.
Davies, John W.; and Wells, Edward C., 4,328,939, Cl. 244-102.00R.
Pond, Charles R.; Texeira, Patrick D.; and Wilbert, Reynold E., 4,329,059, Cl. 356-353.000.
Sauer, Joseph J., 4,328,645, Cl. 51-170.00T.
Yee, James S., 4,329,689, Cl. 343-700.0MS.

Bogdanovic, Borislav, to Studiengesellschaft Kohle mbH. Method of preparing di-organo-magnesium compounds. 4,329,301, Cl. 260-665.00R.

Bohan, John E., Jr., to Honeywell Inc. Relaxation oscillator type spark generator. 4,329,628, Cl. 315-209.0SC.

Bohm, Horst, to Rockwell-Golde, a Gesellschaft mit beschrankter Haftung. Pivotal and slidable auto roof cover. 4,329,594, Cl. 307-10.00R.

Bolis, Goffredo; Giani, Roberto; Pinza, Mario; Pifferi, Giorgio; and Broccali, Giampietro, to C R A F Sud. Formyl derivatives of hydrazinopenicillins. 4,329,285, Cl. 260-239.100.

Bolkart, Alfred: *See—*
Pocrnja, Anton; Bolkart, Alfred; and Dworschak, Josef, 4,328,675, Cl. 60-676.000.

Bolien, Romain L. F.; and Ponsard, Jean-Marie M. G., to C. P. Clare International N.V. Mercury reed switch. 4,329,670, Cl. 335-56.000.

Bolton, Joseph A., to Albany International Corp. Constant vacuum felt dewatering system. 4,329,201, Cl. 162-198.000.

Bomball, William A.: *See—*
Roth, Claris D.; Moser, Kenneth B.; and Bomball, William A., 4,329,449, Cl. 536-18.600.

Bongard, Michel: *See—*
Moyroud, Louis M.; Bongard, Michel; Vernez, Paul A.; and Moulin, Michel, 4,329,027, Cl. 354-5.000.

Bonnarens, Henri: *See—*
Crahay, Jean; Marique, Christian; Bonnarens, Henri; DeFraye, Rene; and Bragard, Adolphe, 4,329,562, Cl. 219-121.0LJ.

Bonsack, James P.; and Schneider, Fred, Jr., to SCM Corporation. Chlorination of titaniferous material using treated coal for vanadium removal. 4,329,322, Cl. 423-74.000.

Bopp, Ferdinand L. Process of preparing pre-press proofs using pressure sensitive adhesive backings. 4,329,420, Cl. 430-293.000.

Bordignon, Abramo. Magnetic tape cassette gasket. 4,328,936, Cl. 242-199.000.

Borel, Robert J.: *See—*
Meldahl, Robert D.; and Borel, Robert J., 4,328,884, Cl. 192-105.0CF.

Borg-Warner Corporation: *See—*
Cheong, Alex S.; and Beldam, Richard P., 4,328,861, Cl. 165-151.000.

Borman, Willem F. H., to General Electric Company. Production of polyesters. 4,329,444, Cl. 528-272.000.

Born, Peter. Machine for cutting and removing cord or band from secured goods. 4,328,609, Cl. 29-564.300.

Boucher, R. Wayne: *See—*
Merchant, Vijay; Henriksen, Stephen R.; Boucher, R. Wayne; and Dodd, Jerrold J., 4,329,210, Cl. 204-107.000.

Bouplon, Edward J., to Allied Steel & Tractor Products, Inc. Underground pipe pusher. 4,329,077, Cl. 403-287.000.

Bouvot, Jean-Francois, to Societe Anonyme Francaise Du Ferodo. Mounting device for a heat exchanger in the casing of a heating, ventilation and/or air conditioning apparatus, particularly for the passenger space of a motor vehicle, and an exchanger provided with such a device. 4,328,859, Cl. 165-78.000.

Bowden, William L.; Foster, Donald L.; Kuo, Han C.; and Moses, Peter R., to Duracell International Inc. Rechargeable non-aqueous cells with complex electrolyte salts. 4,329,404, Cl. 429-50.000.

Bowers, Kenneth E.: *See—*
Beard!, James D.; Nelson, Donald J.; Haller, Kirk J.; and Bowers, Kenneth E., 4,328,887, Cl. 198-396.000.

Bowman, Peter; and Frieze, Allan S., to Warner-Lambert Company. Razor blade assembly with movable cover cap. 4,328,615, Cl. 30-32.000.

Boyd, Gene A. Sewing machine thread tension control system. 4,328,756, Cl. 112-254.000.

Bragard, Adolphe: *See—*
Crahay, Jean; Marique, Christian; Bonnarens, Henri; DeFraye, Rene; and Bragard, Adolphe, 4,329,562, Cl. 219-121.0LJ.

Braginetz, Paul A.; Cline, Quentin E.; and Floyd, Paul D. Slide cam mechanism for positioning test adapter in operative relationship with a receiver. 4,329,005, Cl. 339-18.00B.

Braginetz, Paul A. High density connector module with tri-paddle contact elements. 4,329,008, Cl. 339-217.00S.

Brammall, Inc.: *See—*
Gillette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, 4,328,647, Cl. 51-338.000.

Brammall, Terrence N.: *See—*
Gillette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, 4,328,647, Cl. 51-338.000.

Brandenstein, Manfred: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., 4,328,999, Cl. 308-6.00C.

Brandmaier, C. Edward; and Dennis, Edmund G., to Cashin Systems Corp. Automatic card dispenser and pick-off assembly. 4,328,657, Cl. 53-586.000.

Brandt, Horst: *See—*
Koll, Jochen; Molls, Hans-Heinz; Hornle, Reinhold; Schuffenhauer, Erhard; Brandt, Horst; Bremer, Fritz; Wolf, Karlheinz; and Schiwy, Willy, 4,329,145, Cl. 8-527.000.

Breed Corporation: *See—*
Breed, David S., 4,329,549, Cl. 200-61.45M.

Breed, David S., to Breed Corporation. Magnetically biased velocity change sensor. 4,329,549, Cl. 200-61.45M.

Bremer, Fritz: *See—*
Koll, Jochen; Molls, Hans-Heinz; Hornle, Reinhold; Schuffenhauer, Erhard; Brandt, Horst; Bremer, Fritz; Wolf, Karlheinz; and Schiwy, Willy, 4,329,145, Cl. 8-527.000.

Brenneman, Daniel A., to Trane Company, The. Semiconductor package. 4,329,701, Cl. 357-28.000.

Bressickello, Lindy J.: *See—*
Moore, Henry J., Jr.; and Bressickello, Lindy J., 4,328,791, Cl. 126-427.000.

Bretegnier, Pierre; and Fortassy, Rene, to Eurocable, S.A. Multiply twisting machine for high speed helical winding of unitary strands to form a cable. 4,328,662, Cl. 57-58.610.

Breveteam S.A.: *See—*
Tesch, Bunter, 4,328,641, Cl. 47-59.000.

Brewer, Richard J.; and Wininger, Brice S., to Eastman Kodak Company. Catalyst for and method of preparing cellulose esters. 4,329,447, Cl. 536-69.000.

Brichard, Jean; Colery, Jean-Claude; and Sarot, Pierre, to Interox (Societe Anonyme). Particles of stabilized peroxygenated compounds, process for their manufacture, and composition containing such particles. 4,329,244, Cl. 252-99.000.

Brill, Richard H.: *See—*
McDonough, Robert M.; Hanson, Thomas E.; Brill, Richard H.; and Oates, Ronald W., 4,328,740, Cl. 99-295.000.

Brinkmann, Ludwig: *See—*
Rust, Kurt; Brinkmann, Ludwig; and Lutz, Paul, 4,329,256, Cl. 252-429.00B.

British-American Tobacco Company Limited: *See—*
Naylor, Donald B.; and Baker, Richard R., 4,328,817, Cl. 131-360.000.

British Broadcasting Corporation: *See—*
Monteath, George D.; and Jones, Arthur H., 4,329,684, Cl. 340-707.000.

British Leyland UK Limited: *See—*
Randle, James N., 4,328,851, Cl. 152-330.0RF.

British Steel Corporation: *See—*
Bagwell, Alan D., 4,328,708, Cl. 73-622.000.

Broccali, Giampietro: *See—*
Bolis, Goffredo; Giani, Roberto; Pinza, Mario; Pifferi, Giorgio; and Broccali, Giampietro, 4,329,285, Cl. 260-239.100.

Brocks, Klaus: *See—*
Richter, Henning; and Brocks, Klaus, 4,328,858, Cl. 165-45.000.

Brodie, Alastair C.; and Wetherill, Lewis A., to Glaxo Group Limited. Cephalosporin antibiotic. 4,329,453, Cl. 544-25.000.

Bronner, Juergen, to Akzona Incorporated. Matting for hydraulic engineering end-uses. 4,329,392, Cl. 428-296.000.

Brower, Van P.; and Hopfe, Harold H., to Monsanto Company. Sheet stress relaxation. 4,329,315, Cl. 264-555.000.

Brown, Boveri & Cie AG: *See—*
Gross, Franz; and Birnbreier, Hermann, 4,329,407, Cl. 429-101.000.

Brown, James H.; and Olenberg, Harry, to Jojoba Growers & Processors Inc. Isomerization of jojoba oil and products thereof. 4,329,298, Cl. 260-405.600.

Brown & Williamson Tobacco Corporation: *See*—
Coghill, Philip H., II, 4,328,816, Cl. 131-305.000.

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Bruce's Splicing & Rigging Co., Inc.: *See*—
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Sommer, August; Heitmann, Wilhelm; and Brucker, Rainer, 4,329,257, Cl. 252-435.000.

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Brunelle, Daniel J., to General Electric Company. Process for polyester-carbonate transesterifications. 4,329,443, Cl. 528-180.000.

Brunner, Anton, to Siemens Aktiengesellschaft. Primary radar antenna having a secondary radar antenna integrated therewith. 4,329,692, Cl. 343-780.000.

Brunswick Corporation: *See*—
Hale, David J., 4,328,770, Cl. 123-59.00B.
Wilhelm, Raymond L., 4,328,822, Cl. 137-68.00R.

Bruton, Durwood B. Pressure calibration device. 4,328,698, Cl. 73-4.00R.

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Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., 4,329,466, Cl. 546-125.000.

Buckley, W. Derek, to Perkin-Elmer Corporation, The. Production of X-ray lithograph masks. 4,329,410, Cl. 430-5.000.

Budd Company, The: *See*—
Presto, Douglas A., 4,328,642, Cl. 49-502.000.

Bugaut, Andree; and Vandenbossche, Jean-Jacques. Metaphenylenediamines. 4,329,504, Cl. 564-443.000.

Bull, Hendrix R. Energy saving heavy crude oil emulsion treating method and apparatus for use therewith. 4,329,159, Cl. 55-42.000.

Bullock, Richard H. D., Jr.: *See*—
Gordon-Clark, Matthew R.; Bullock, Richard H. D., Jr.; and Fogle, H. William, Jr., 4,328,931, Cl. 242-67.500.

Bulten-Kanthal AB: *See*—
Hjortsberg, Bengt; and Fredriksson, Tommy, 4,329,569, Cl. 219-535.000.

Bungo, Edward M., to General Motors Corporation. Electrical connector. 4,329,009, Cl. 339-223.00R.

Buono, Frederick J.; and Hoch, Samuel, to Tenneco Chemicals, Inc. Accelerator systems for polyester resin compositions. 4,329,263, Cl. 525-17.000.

Burkett, Robert A.; Daughton, John W.; Ellis, Robert G.; Wartinger, Raymond C.; and Williamson, Clayton L., Jr., to Xerox Corporation. Method for operating a reproduction machine with unlimited catch tray for multimode operation. 4,329,046, Cl. 355-77.000.

Burnett, Archibald L.: *See*—
Miller, John C.; and Burnett, Archibald L., 4,329,313, Cl. 264-349.000.

Burroughs Corporation: *See*—
Holz, George E.; and Ogle, James A., 4,329,616, Cl. 313-198.000.
Mahon, Michael J.; and Shanks, Roy R., 4,329,685, Cl. 340-825.840.
Thompson, Charles E.; and Newell, Roger G., 4,328,610, Cl. 29-571.000.

Burroughs Wellcome Co.: *See*—
Harfenist, Morton, 4,329,365, Cl. 424-324.000.
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,329,362, Cl. 424-320.000.

Burton, Earl F.: *See*—
Dighe, Deepak V.; Burton, Earl F.; and Wozniak, Robert J., 4,328,849, Cl. 152-176.000.

Burton, Tracey L.: *See*—
Lou, Kingdon; and Burton, Tracey L., 4,329,151, Cl. 23-230.00B.

Buschbom, Floyd E.; Hansen, Glen D.; Paulson, Jerome T.; and Anderson, Clifton W., to Veda, Inc. Silo unloader leveling apparatus. 4,329,105, Cl. 414-316.000.

Busse-Machukas, Vladimir B.: *See*—
Druzhinin, Ernest A.; Kubasov, Vladimir L.; Busse-Machukas, Vladimir B.; Lvovich, Florenty I.; Krongauz, Evgeny L.; and Jurkov, Leonid I., 4,329,219, Cl. 204-290.00F.

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Eymond, Philip R. N.; and Butterworth, Robert M., 4,329,245, Cl. 252-102.000.

Buvik, Stig. Device for laying road material. 4,329,081, Cl. 404-110.000.

Byrd, Geoffrey C. M.; and Stanier, Colin, to Imperial Chemical Industries Limited. Cladding cathode of electrolytic cell with diaphragm or membrane. 4,329,217, Cl. 204-252.000.

C. E. Pollard Company: *See*—
Patterson, Albert E.; and Pollard, Timothy C., 4,328,988, Cl. 296-10.000.

C. P. Clare International N.V.: *See*—
Bollen, Romain L. F.; and Ponsard, Jean-Marie M. G., 4,329,670, Cl. 335-56.000.

C R A F Sud: *See*—
Bolis, Goffredo; Giani, Roberto; Pinza, Mario; Pifferi, Giorgio; and Broccali, Giampietro, 4,329,285, Cl. 260-239.100.

Cabaniss, Weldon B., III. Smokeless tobacco pipe. 4,328,795, Cl. 131-180.000.

Cadbury Schweppes Limited: *See*—
Jeans, Edward L., 4,328,909, Cl. 222-54.000.

Calton, Gary J.: *See*—
Updike, Mark H.; and Calton, Gary J., 4,329,427, Cl. 435-116.000.

Campbell, Howard H.: *See*—
Rodler, Waldo E., Jr.; and Campbell, Howard H., 4,328,601, Cl. 114-353.000.

Campbell, John W.; and Childs, Charles W. Prosthetic foot. 4,328,594, Cl. 3-7.000.

Canada-Cities Service, Ltd.: *See*—
Cymbalisty, Lubomyr M. O.; and Shaw, Robert C., 4,328,710, Cl. 73-863.860.

Canon Kabushiki Kaisha: *See*—
Asano, Noriyuki; Niwa, Yukichi; Ohwada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,329,577, Cl. 250-201.000.
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,329,412, Cl. 430-42.000.
Kitajima, Tadayuki; Kasamura, Toshirou; Aoki, Tomohiro; Takeoka, Yoshihiko; and Namekata, Kiyokazu, 4,329,044, Cl. 355-15.000.
Kitamura, Takashi; and Ito, Michio, 4,329,413, Cl. 430-54.000.
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,329,033, Cl. 354-25.000.
Minoura, Kazuo; Kiyohara, Takehiko; and Uchiyama, Haruo, 4,329,012, Cl. 350-6.800.
Murakami, Hiroyasu; Uchidoi, Masanori; Yamamichi, Masayoshi; Shinoda, Nobuhiko; Suzuki, Masayuki; and Ito, Tadashi, 4,329,034, Cl. 354-37.000.
Yamaguchi, Shin; Tajima, Akira; and Ikemori, Keiji, 4,329,022, Cl. 350-426.000.

Cantrell, Clifford M.: *See*—
Petrek, John P.; and Cantrell, Clifford M., 4,329,204, Cl. 202-174.000.

Capitini, Robert; and Roveyaz, Paul, to Commissariat a l'Energie Atomique. Light absorption spectrum analyzer. 4,329,048, Cl. 356-73.000.

Carcia, Peter P.; Whiteside, George D.; and Woodbury, Arthur N., to Polaroid Corporation. Photographic system for varying flash fire aperture as a function of ambient scene light. 4,329,031, Cl. 354-23.00D.

Carella, Richard F. Archery bowsight (between range). 4,328,625, Cl. 33-265.000.

Carondelet Foundry Company: *See*—
Culling, John H., 4,329,173, Cl. 75-125.000.

Carpentier, Yves: *See*—
Jardillier, Jean-Claude; Carpentier, Yves; and Desoize, Bernard, 4,329,346, Cl. 424-251.000.

Cartland, William H., to Solar Development Inc. Alcohol distillation apparatus. 4,329,206, Cl. 202-177.000.

Cashin Systems Corp.: *See*—
Brandmaier, C. Edward; and Dennis, Edmund G., 4,328,657, Cl. 53-586.000.

Cassella Aktiengesellschaft: *See*—
Bauer, Wolfgang; and Kuhlein, Klaus, 4,329,503, Cl. 564-418.000.

Caterpillar Tractor Co.: *See*—
Keske, Frank E., 4,329,000, Cl. 308-187.000.
Manna, Albert, 4,328,719, Cl. 74-845.000.

Cauler, Caroline A.: *See*—
Wisnosky, Jerome D.; and Cauler, Caroline A., 4,329,421, Cl. 430-322.000.

Caviness, Theodore G., to Container Corporation of America. Camera structure. 4,329,037, Cl. 354-187.000.

Celanese Corporation: *See*—
Hackman, Edward B.; Zeagler, Larry D.; McLaughlin, James S.; and Peabody, Carl M., 4,329,511, Cl. 568-454.000.

Central Glass Company, Limited: *See*—
Asagao, Soichi; Nakatani, Masaru; Nakagawa, Shinsuke; Takahara, Yoshiyuki; and Okada, Naoki, 4,329,326, Cl. 423-308.000.

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Crahay, Jean; Marique, Christian; Bonnarens, Henri; DeFraye, Rene; and Bragard, Adolphe, 4,329,562, Cl. 219-121.0LJ.

Chakrabarti, Paritosh M.; and Kirchner, Darrell G., to GAF Corporation. Polyethyleneoxy sulfonate surfactants. 4,329,268, Cl. 524-166.000.

Chamberlain, Jerry E., to Siemens Medical Laboratories, Inc. Particle accelerator. 4,329,654, Cl. 328-233.000.

Chambers, Dale T., to Copeland Corporation. Discharge valve. 4,329,125, Cl. 417-569.000.

Chamran, Morteza M.; Scott, Larkin B.; and Williams, Paul B., to Perkin-Elmer Corporation, The. Spectrophotometer improvement of improved automatic wavelength indexing initialization apparatus. 4,329,051, Cl. 356-320.000.

Chan, Keng S.: *See*—
Alford, Harvey E.; and Chan, Keng S., 4,329,236, Cl. 252-8.55D.

Chang, Kern K. N., to RCA Corporation. Horizontal deflection enhancement for kinescopes. 4,329,618, Cl. 313-431.000.

Chapa, Amadeo. Ditching over buried lines. 4,329,084, Cl. 405-157.000.

Chapman, Claude L. Apparatus and methods for line stringing. 4,328,952, Cl. 254-134.30R.

Charbonnier, Francis M.; and Long, Paul V., to Hewlett-Packard Company. Defibrillator with means for determining patient impedance and delivered energy. 4,328,808, Cl. 128-419.00D.

Chemische Werke Huels Aktiengesellschaft: *See*—
Diebel, Klaus, 4,329,243, Cl. 252-75.000.
Chemische Werke Huls Aktiengesellschaft: *See*—
Sommer, August; Heitmann, Wilhelm; and Brucker, Rainer, 4,329,257, Cl. 252-435.000.
Chen, Bor-Uei, to Hughes Aircraft Company. Optical waveguide formed by diffusing metal into substrate. 4,329,016, Cl. 350-96.120.
Chen, Fang-Shang, to Bell Telephone Laboratories, Incorporated. Feedback control of lasers in fiber optic systems. 4,329,659, Cl. 331-94.550.
Cheong, Alex S.; and Beldam, Richard P., to Borg-Warner Corporation. Louvred fins for heat exchangers. 4,328,861, Cl. 165-151.000.
Cheung, William S. H., to Payview Limited. Apparatus for encoding of information. 4,329,711, Cl. 358-114.000.
Chevron Research Company: *See*—
Fries, Bernard A., 4,328,700, Cl. 73-40.700.
Lilburn, Jennifer E., 4,329,240, Cl. 252-51.50A.
Childers, Roger B. Cover apparatus for the cargo bed of pickup trucks, travel, trailers and the like. 4,328,989, Cl. 296-27.000.
Childs, Charles W.: *See*—
Campbell, John W.; and Childs, Charles W., 4,328,594, Cl. 3-7.000.
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Doi, Atsutoshi; Aiki, Kunio; Chinone, Naoki; Nakamura, Satoshi; and Ito, Ryoichi, 4,329,658, Cl. 372-45.000.
Chiu, Chung-Wai; and Krieg, Walter J., to National Starch and Chemical Corporation. Method for preparing alkaline corrugating adhesive. 4,329,181, Cl. 106-213.000.
Chmielowiec, Jan. Mercuro-organic bonded phase sorbents. 4,329,254, Cl. 252-430.000.
Chorvat, Robert J., to G. D. Searle & Co. 24-Cyclopropylcholene-3β, 22-diols and esters thereof. 4,329,295, Cl. 260-397.200.
Chou, Kechia J., to Texaco Inc. Hydrocarbyl dihydrouracil, its method of preparation and lubricating oil composition containing same. 4,329,239, Cl. 252-51.50A.
Christe, Karl O.; and Wilson, Richard D., to Rockwell International Corporation. Iodine (VII) oxytetrafluorohypofluorite and a process for preparing the same. 4,329,330, Cl. 423-473.000.
Christenson, James G.; and Pecherer, Benjamin, to Hoffmann-La Roche Inc. Hapten compositions. 4,329,281, Cl. 260-112.00B.
Christianson, Roger D., to Deutsch Company Metal Components Division, The. Fluid fitting. 4,328,982, Cl. 285-351.000.
Christy, Marcia E.: *See*—
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,329,465, Cl. 546-072.000.
Chromalloy American Corporation: *See*—
Hall, Edward N., 4,328,865, Cl. 166-302.000.
Chu, Chin-Chiun, to Mobil Oil Corporation. Shape selective reactions with zeolite catalysts modified with group IA metals. 4,329,533, Cl. 585-466.000.
Cianci, James P., to Kendall Company, The. Drainage system with vent. 4,328,828, Cl. 137-549.000.
Ciba-Geigy AG: *See*—
Libicky, Arnost; and Mueller, Walter E., 4,329,042, Cl. 354-324.000.
Tzikas, Athanassios, 4,329,456, Cl. 544-113.000.
Ciba-Geigy Corporation: *See*—
Eugster, Peter; and Koller, Stefan, 4,329,144, Cl. 8-526.000.
Francis, John E., 4,329,367, Cl. 424-330.000.
Huebner, Charles F., 4,329,348, Cl. 424-251.000.
Rempfler, Hermann; and Fory, Werner, 4,329,167, Cl. 71-94.000.
Rosen, Melvin H., 4,329,357, Cl. 424-275.000.
Zurbuchen, Jacques; and Leutenegger, Willi, 4,329,146, Cl. 8-580.000.
Cikut, John J.; Crane, Irving D., Jr.; and Princiotto, Theodore, Jr., to Exxon Research & Engineering Co. Multi-stage gas liquid reactor. 4,329,234, Cl. 210-752.000.
Clairol Incorporated: *See*—
Kunz, Raymond W.; and Fleischhauer, Eugene T., 4,329,567, Cl. 219-222.000.
Clark Equipment Company: *See*—
Den Bleyker, Joseph R., 4,329,109, Cl. 414-685.000.
Clayton, Richard W., to RCA Corporation. Tape transducer carrier with dihedral and protrusion adjustment. 4,329,724, Cl. 360-109.000.
Clayware Pty. Ltd.: *See*—
Owen, Douglas B., 4,328,786, Cl. 126-174.000.
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Process for separating esters of fatty and rosin acids. 4,329,280, Cl. 260-97.600.
Clement, Michel; and Alais, Pierre, to Agence Nationale de Valorisation de la Recherche. Ultrasonic image reconstruction methods and apparatus. 4,328,707, Cl. 73-618.000.
Clevepak Corporation: *See*—
Souza, Ronald; and Dunne, Owen F., 4,328,758, Cl. 112-286.000.
Clifford Edwards Limited: *See*—
Heath, Richard C., 4,328,867, Cl. 169-58.000.
Cline, Quentin E.: *See*—
Braginetz, Paul A.; Cline, Quentin E.; and Floyd, Paul D., 4,329,005, Cl. 339-18.00B.
Coghill, Philip H., II, to Brown & Williamson Tobacco Corporation. Process for improving the fill power of reconstituted tobacco. 4,328,816, Cl. 131-305.000.
Cohen, Sheppard: *See*—
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Colery, Jean-Claude: *See*—
Brichard, Jean; Colery, Jean-Claude; and Sarot, Pierre, 4,329,244, Cl. 252-99.000.
Colgate-Palmolive Company: *See*—
Su, Dean T.; and Schubert, Warren R., 4,329,334, Cl. 424-70.000.
Su, Dean T.; and Schubert, Warren R., 4,329,335, Cl. 424-70.000.
Su, Dean T.; and Schubert, Warren R., 4,329,336, Cl. 424-70.000.
Wixon, Harold E., 4,329,237, Cl. 252-8.750.
Collins, Royal D.: *See*—
Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., 4,329,246, Cl. 252-103.000.
Collins, Scott J.: *See*—
Filipowicz, Edwin A.; Cornell, Robert W.; and Collins, Scott J., 4,329,001, Cl. 312-71.000.
Colombo, Edward A.; and Tsai, James T., to Mobil Oil Corporation. Method and apparatus for the measurement of cell size in a foam structure. 4,329,052, Cl. 356-335.000.
Columbia Industries, Inc.: *See*—
Orlando, Samuel J.; and Miller, Charles M., Jr., 4,328,967, Cl. 273-63.00G.
Colvin, Darrell W. Bar light. 4,329,740, Cl. 362-184.000.
Combustion Engineering, Inc.: *See*—
Jones, Brian C., 4,329,324, Cl. 423-244.000.
Cominco Ltd.: *See*—
Liang, Shou C., 4,328,921, Cl. 228-222.000.
Commissariat a l'Energie Atomique: *See*—
Capitini, Robert; and Roveyaz, Paul, 4,329,048, Cl. 356-73.000.
Enjolras, Hubert, 4,328,827, Cl. 137-512.200.
Commonwealth of Australia: *See*—
Goodman, Graeme D., 4,328,754, Cl. 102-277.000.
Communications Satellite Corporation: *See*—
Meulenberg, Andrew, Jr., 4,329,731, Cl. 361-218.000.
Communications Technology Corporation: *See*—
Mangrobang, Maurice G.; and Waas, Charles W., 4,329,537, Cl. 174-84.00C.
Compagnie Francaise de Raffinage: *See*—
Engelhard, Philippe; and Szabo, Georges, 4,329,258, Cl. 252-441.000.
Composite Technology, Inc.: *See*—
Green, Andrew; Rogers, Charles W.; and Upton, Clarence D., 4,329,194, Cl. 156-179.000.
Conn, Paul J.; and Post, Martin F. M., to Shell Oil Company. Process for the preparation of aromatic hydrocarbon mixture. 4,329,532, Cl. 585-407.000.
Connell, James. Vehicle wheel trim. 4,328,997, Cl. 301-37.00P.
Conoco Inc.: *See*—
Yang, Kang; Nield, Gerald L.; and Washecheck, Paul H., 4,329,515, Cl. 568-621.000.
Conrad, Raymond W.; and Kidron, Aryeh, to United States of America, Army. High power laser irradiance display material. 4,329,583, Cl. 250-330.000.
Container Corporation of America: *See*—
Caviness, Theodore G., 4,329,037, Cl. 354-187.000.
Continental Group, Inc., The: *See*—
Walter, John, 4,328,906, Cl. 220-260.000.
Cooley, Edmund A.; Long, Robert; and Ness, Phillip D., to General Electric Company. Boring and facing apparatus for use inside a large vessel. 4,329,094, Cl. 408-77.000.
Cooper, Robert P., to American Hospital Supply Corporation. Catheter with trans-luminal gas pathway. 4,328,806, Cl. 128-349.00B.
Copeland Corporation: *See*—
Chambers, Dale T., 4,329,125, Cl. 417-569.000.
Copeland, Louis E.: *See*—
Morrill, Charles D.; Des Lierres, John M.; and Copeland, Louis E., 4,329,085, Cl. 405-169.000.
Coplan, Myron J.; and Bilewski, Friedhelm, to Albany International Corp. Means for slicing module termination plug. 4,328,730, Cl. 83-581.000.
Corax Corporation: *See*—
Manson, Morris, 4,328,998, Cl. 308-3.800.
Coreth, Alois, to Lapides Corporation. Telescoping tubes with a twist locking arrangement. 4,329,076, Cl. 403-109.000.
Cornell, Robert W.: *See*—
Filipowicz, Edwin A.; Cornell, Robert W.; and Collins, Scott J., 4,329,001, Cl. 312-71.000.
Corning Glass Works: *See*—
Cunningham, George M., 4,328,856, Cl. 165-8.000.
Ference, Joseph; Megles, John E., Jr.; and Rittler, Hermann L., 4,329,400, Cl. 428-426.000.
Noll, Burton A.; and Suhey, Richard P., 4,328,857, Cl. 165-8.000.
Pitcher, Wayne H., Jr., 4,329,162, Cl. 55-523.000.
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Rigg, George P.; Cornsweet, Tom N.; Rough, J. Kirkwood H.; Ogle, H. Malcolm; Prunella, Wallace R.; and Schiller, Lawrence H., 4,329,049, Cl. 356-124.000.
Cornwell, William D., Jr.: *See*—
Angi, Donald F.; and Cornwell, William D., Jr., 4,329,605, Cl. 310-68.00R.
Corona, Stephen C.; and Northrup, Karl A., to Xerox Corporation. Low pressure gas discharge lamp with increased end illumination. 4,329,622, Cl. 315-49.000.
Cotey, John. Viscous fluid damping system. 4,328,639, Cl. 46-169.00A.
Coulson, Charles E.: *See*—
Johnston, Richard P.; Knapp, Malcolm H.; and Coulson, Charles E., 4,329,114, Cl. 415-145.000.

Coulter Systems Corporation: *See—*
Kuehnle, Manfred R., 4,329,043, Cl. 355-14.00R.

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Cowen, Theodore A.; and Jackovin, Gary B., to Belvedere Company, Inc. Manicure table. 4,329,002, Cl. 312-196.000.

Cox, Kenneth K. Wood and coal burning heating unit. 4,328,784, Cl. 126-67.000.

Cox, Roger B.; and Steer, David C., to Lever Brothers Company. Microbial heteropolysaccharide. 4,329,448, Cl. 536-123.000.

Craft, James A., to International Business Machines Corporation. Single use ribbon cartridge with frangible resistive element for restraining the takeup spool. 4,329,073, Cl. 400-208.000.

Crahay, Jean; Marique, Christian; Bonnarens, Henri; DeFraye, Rene; and Bragard, Adolphe, to Centre de Recherches Metallurgiques-Centrum voor Research in Metallurgie. Method and device for improving the properties of thin steel plates. 4,329,562, Cl. 219-121.0LJ.

Cramer, Chris: *See—*
Gillette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, 4,328,647, Cl. 51-338.000.

Crane, Irving D., Jr.: *See—*
Cikut, John J.; Crane, Irving D., Jr.; and Princiotto, Theodore, Jr., 4,329,234, Cl. 210-752.000.

Crates, James M.: *See—*
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Eichmuller, Karl; and Dubach, Werner, 4,328,637, Cl. 43-121.000.

Crivello, James V.; and Lam, Julia H., to General Electric Company. Method for making diaryliodonium polyhalometalloid salts. 4,329,300, Cl. 260-440.000.

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Crocker, Burton B.: *See—*
Bagley, Melvin R.; Crocker, Burton B.; and Pysz, John F., 4,329,526, Cl. 570-203.000.

Crowder, Billy L.; and Reisman, Arnold, to International Business Machines Corporation. Doped polysilicon silicide semiconductor integrated circuit interconnections. 4,329,706, Cl. 357-71.000.

Crowe, William D.; and Snell, Darrell E., to J. R. Schneider Co., Inc. Filter plate for horizontal plate filter. 4,329,228, Cl. 210-230.000.

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Hanke, David E., 4,329,394, Cl. 428-342.000.

Cuda, John: *See—*
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Culling, John H., to Carondelet Foundry Company. Alloy resistant to corrosion. 4,329,173, Cl. 75-125.000.

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Heydrich, Hans; Woods, Melvin E.; and Geary, William C., 4,328,772, Cl. 123-193.0CH.

Cummins, James R., Jr., to General Electric Company. Heat recovery anti-icing system. 4,328,666, Cl. 60-39.09D.

Cunningham, George M., to Corning Glass Works. Heat recovery wheel. 4,328,856, Cl. 165-8.000.

Curley, Edward M.; and Homan, Gerlof, to Survival Technology, Inc. Wet dry syringe package. 4,328,802, Cl. 128-272.100.

Curran, Roger J.: *See—*
Oberg, James L.; Curran, Roger J.; and Czayka, Michael, 4,328,750, Cl. 102-514.000.

Cutter Laboratories, Inc.: *See—*
Morin, Marius J., 4,328,946, Cl. 251-9.000.

Cyklop Strapping Corp.: *See—*
Discavage, James L., 4,328,742, Cl. 100-32.000.

Cymbalisty, Lubomyr M. O.; and Shaw, Robert C., to Petro-Canada Exploration Inc.; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Pan-Canadian Petroleum Limited; Esso Resources Canada Ltd.; Canada-Cities Service, Ltd.; and Gulf Canada Resources Inc. Homogenizer/-subsampler for tar sand process streams. 4,328,710, Cl. 73-863.860.

Czayka, Michael: *See—*
Oberg, James L.; Curran, Roger J.; and Czayka, Michael, 4,328,750, Cl. 102-514.000.

Dage, Richard C.: *See—*
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,329,470, Cl. 546-210.000.
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Dagenhart, William K.; and Stirling, William L., to United States of America, Energy. Electron energy recovery system for negative ion sources. 4,329,586, Cl. 250-426.000.

Dagn, Josef. Apparatus for mounting a pipe in an opening in a pressure vessel wall. 4,328,837, Cl. 138-89.000.

Dahl, Ernest A.; and Barry, George H. Specific gravity transducer and battery performance indicator. 4,329,406, Cl. 429-92.000.

Daimler-Benz Aktiengesellschaft: *See—*
Heinz, Werner; Schmidt, Adolf; and Jambor, Arno, 4,329,738, Cl. 362-61.000.

Dallas, William J.; Linde, Rolf; and Weiss, Hermann, to U.S. Philips Corporation. Method of manufacturing inverse filters by holographic techniques. 4,329,020, Cl. 350-162.0SF.

Dalton, Augustine I., Jr.; and Skinner, Ronald W., to Air Products and Chemicals, Inc. Method for the recovery of salts of group VIII noble metals from solutions. 4,329,321, Cl. 423-22.000.

Damon, Robert E., II; and Nadelson, Jeffrey, to Sandoz, Inc. 6-C_1-4Alkyl-7-phenyl or substituted phenyl-1,6-naphthyridine-5(6H)-ones. 4,329,349, Cl. 424-256.000.

Danford, Glenn S., to Southwest Utilities, Inc. Communication system. 4,329,543, Cl. 179-1.0HF.

Danner, Bernard, to Sandoz Ltd. Cationic surfactant-containing aqueous wax dispersions, and their use as textile finishing agents. 4,329,390, Cl. 428-264.000.

Darlington, Robert P.: *See—*
Lefevre, William; and Darlington, Robert P., 4,328,619, Cl. 33-161.000.

Datafile Limited: *See—*
Barber, Donald T., 4,329,191, Cl. 156-64.000.

Daughton, John W.: *See—*
Burkett, Robert A.; Daughton, John W.; Ellis, Robert G.; Wartinger, Raymond C.; and Williamson, Clayton L., Jr., 4,329,046, Cl. 355-77.000.

Davies, John W.; and Wells, Edward C., to Boeing Company, The. Airplane main landing gear assembly. 4,328,939, Cl. 244-102.00R.

Davis, Larry: *See—*
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,329,464, Cl. 546-17.000.

Davis, Stephen H.; and Simpson, Daniel W., to Water Refining Company, Inc. Mixed bed deionizer. 4,329,225, Cl. 210-96.100.

Davis, Walter L., to Motorola, Inc. Low voltage current mirror. 4,329,639, Cl. 323-315.000.

Davison, Michael J.: *See—*
Tumber, Brian W.; and Davison, Michael J., 4,328,697, Cl. 73-3.000.

Davy International Aktiengesellschaft: *See—*
Al-Muddarris, Ghazi R., 4,329,516, Cl. 568-697.000.

Dawson, Peter H.: *See—*
French, J. Barry; and Dawson, Peter H., 4,329,582, Cl. 250-292.000.

Dayco Corporation: *See—*
White, Jack D., Jr.; and Gayer, Melvin D., 4,329,192, Cl. 156-138.000.

DBX, Inc.: *See—*
Welland, David R., 4,329,598, Cl. 307-296.00R.

Dedolph, Richard R. Method of forming a urethane prepolymer and its use in consolidating aggregate material. 4,329,436, Cl. 521-99.000.

Deere & Company: *See—*
Petrie, Ivan L., 4,328,836, Cl. 138-30.000.

DeFraye, Rene: *See—*
Crahay, Jean; Marique, Christian; Bonnarens, Henri; DeFraye, Rene; and Bragard, Adolphe, 4,329,562, Cl. 219-121.0LJ.

De Gaetano, Mario: *See—*
Rossi, Pietro P.; and De Gaetano, Mario, 4,329,297, Cl. 260-404.000.

De Graw, Joseph I.: *See—*
Almquist, Ronald G.; and De Graw, Joseph I., 4,329,473, Cl. 546-281.000.

Degussa Aktiengesellschaft: *See—*
Kilian, Eberhard; and Schneider, Georg, 4,329,164, Cl. 65-21.200.
Werle, Peter; and Pohl, Gerhard, 4,329,519, Cl. 568-854.000.

Deibert, Daniel T. Retracting collar-mounted leash. 4,328,766, Cl. 119-109.000.

Delalande S.A.: *See—*
Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., 4,329,466, Cl. 546-125.000.

Delamater, John R.: *See—*
Westcott, Robert F.; and Delamater, John R., 4,329,307, Cl. 264-160.000.

DeLaMoneda, Francisco H.: *See—*
Kotecha, Harish N.; and DeLaMoneda, Francisco H., 4,329,186, Cl. 148-1.500.

Delbridge, Albert J., to Du Pont de Nemours, E. I., and Company. Shaft seal with fluid pressure and spring bias. 4,328,973, Cl. 277-3.000.

Del Pesco, Thomas W., to Du Pont de Nemours, E. I., and Company. Process for preparing a tetrahydrofuran-alkylene oxide copolymer with treated bentonite catalyst. 4,329,445, Cl. 528-416.000.

De Marais, Joseph R.: *See—*
Robinson, Joseph K.; Vander Graff, Max; and De Marais, Joseph R., 4,328,718, Cl. 74-833.000.

Demmin, Timothy R.; and Rogic, Milorad M., to Allied Corporation. Preparation of 6-aminocaproic acid via muconic acid mononitrile. 4,329,498, Cl. 562-553.000.

Den Bleyker, Joseph R., to Clark Equipment Company. Vehicle lifting attachment. 4,329,109, Cl. 414-685.000.

Denlinger, George W.; Wiley, Robert A.; and Yu, James H., to Mead Corporation, The. Ink jet fluid system. 4,329,696, Cl. 346-75.000.

Denner, Horst B. W.; and Tietze, Armin R., to International Business Machines Corporation. Manufacturing process for foil magnetic recording disks. 4,328,607, Cl. 29-169.500.

Dennis, Edmund G.: *See—*
Brandmaier, C. Edward; and Dennis, Edmund G., 4,328,657, Cl. 53-586.000.

Dergazarian, Thomas E., to Dow Chemical Company, The. Selective solvent extraction of symmetrical tetrachloropyridine. 4,329,474, Cl. 546-345.000.

Desai, Rohit: *See—*
Shroff, James R.; and Desai, Rohit, 4,329,345, Cl. 424-251.000.

Designs for Vision, Inc.: *See—*
Feinbloom, Richard, 4,329,015, Cl. 350-91.000.

Des Lierres, John M.: *See—*
Morrill, Charles D.; Des Lierres, John M.; and Copeland, Louis E., 4,329,085, Cl. 405-169.000.

Desoize, Bernard: *See—*
Jardillier, Jean-Claude; Carpentier, Yves; and Desoize, Bernard, 4,329,346, Cl. 424-251.000.

Desrosiers, J. Armand; and Arner, Ralph B. Weed harvester. 4,328,658, Cl. 56-8.000.

Detty, Michael R.; Goliber, Thomas E.; Murray, Bruce J.; and Perlstein, Jerome H., to Eastman Kodak Company. 1,2-Oxachalcogenol-1-ium salts. 4,329,284, Cl. 260-239.00R.

Detweiler, Michael B.; Lawrence, Paul J.; and Townsley, Charles W., to Smithkline Instruments, Inc. Method of stabilizing a specimen slide for occult blood testing. 4,329,317, Cl. 422-58.000.

Deushi, Takeo; Iwasaki, Akio; Kamiya, Kazuhiro; Mizoguchi, Toshimi; Nakayama, Masahito; Itoh, Hisakatsu; and Mori, Toshihito, to Kowa Company, Ltd. Process for preparation of antibiotics and biologically pure culture for use therein. 4,329,426, Cl. 435-80.000.

Deutsch Company Metal Components Division, The: *See—*
Christianson, Roger D., 4,328,982, Cl. 285-351.000.

De Vries, Enno B.: *See—*
van der Weijst, Ludovicus B. J. O.; De Vries, Enno B.; and Heiszwolf, Gerard J., 4,329,514, Cl. 568-577.000.

Dewald, James R., to Dow Chemical Company, The. Separation of 3,5-dichlorocumene from a mixture of 3,5-dichlorocumene and 2,4-dichlorocumene. 4,329,524, Cl. 570-190.000.

Diamalt Aktiengesellschaft: *See—*
Kaniss, Normann; and Bauer, Adolf, 4,329,497, Cl. 562-478.000.

Dice, Harry E.; and Hardesty, George K. C. Booby-trapped lock cylinder with integral intrusion detector. 4,328,692, Cl. 70-421.000.

Dickson, Donald L.; and Dickson, Steven L. Street sweeping machine. 4,328,603, Cl. 15-84.000.

Dickson, Steven L.: *See—*
Dickson, Donald L.; and Dickson, Steven L., 4,328,603, Cl. 15-84.000.

Didier Engineering GmbH: *See—*
Habermehl, Diethard; and Kucharzyk, Werner, 4,329,141, Cl. 432-17.000.

Diebel, Klaus, to Chemische Werke Huels Aktiengesellschaft. Cavitation-inhibiting, nonfreezing, cooling and/or heat-transfer fluids. 4,329,243, Cl. 252-75.000.

Dighe, Deepak V.; Burton, Earl F.; and Wozniak, Robert J., to Uniroyal, Inc. Vehicle tire with tractive elements. 4,328,849, Cl. 152-176.000.

Dimitrov, Borislav A.: *See—*
Dimov, Kiril D.; Vassilev, Nikelay B.; Dimitrov, Dimiter G.; Terlemezyan, Ekaterina I.; Georgieva, Angelina H.; and Dimitrov, Borislav A., 4,329,185, Cl. 134-26.000.

Dimitrov, Dimiter G.: *See—*
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Director-General of Agency of Industrial Science and Technology: *See—*
Orito, Yoshio; Imai, Sumi; and Niwa, Shuichi, 4,329,487, Cl. 560-60.000.

Discavage, James L., to Cyklop Strapping Corp. Strapping apparatus feed and tension mechanism. 4,328,742, Cl. 100-32.000.

Doane, Martin R.: *See—*
Vander Meer, Clayton H.; and Doane, Martin R., 4,329,576, Cl. 235-489.000.

Dobo, Emerick J.; and Graham, Tommy E., to Monsanto Company. Inorganic anisotropic hollow fibers. 4,329,157, Cl. 55-16.000.

Dodd, Jerrold J.: *See—*
Merchant, Vijay; Henriksen, Stephen R.; Boucher, R. Wayne; and Dodd, Jerrold J., 4,329,210, Cl. 204-107.000.

Doi, Atsutoshi; Aiki, Kunio; Chinone, Naoki; Nakamura, Satoshi; and Ito, Ryoichi, to Hitachi, Ltd. Semiconductor laser device. 4,329,658, Cl. 372-45.000.

Dolkemeyer, Wilfried; Erdt, Kurt; Hentges, Rene; and Meisenburg, Ewald, to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft. Process for obtaining carbon black from aqueous suspensions. 4,329,329, Cl. 423-461.000.

Doll, Duane E.: *See—*
Steele, Robert D.; and Doll, Duane E., 4,329,097, Cl. 411-88.000.

Dolzhenkov, Boris S. Apparatus for stirring molten metal in container. 4,328,958, Cl. 266-233.000.

Doman, Glidden S., to United Technologies Corporation. Wind turbine with drive train disturbance isolation. 4,329,117, Cl. 416-170.00R.

Dome Petroleum Limited: *See—*
O'Rourke, J. Cam; Pilkington, G. Roger; and Bercha, Frank G., 4,328,760, Cl. 114-67.00A.

Doorakian, George A.; and Schmidt, Donald L., to Dow Chemical Company, The. Cyclic meta-sulfonium-phenoxide zwitterions. 4,329,480, Cl. 549-78.000.

Dorlars, Alfons: *See—*
Klauke, Erich; Kysela, Ernst; Stuwe, Arnd; and Dorlars, Alfons, 4,329,458, Cl. 544-217.000.

Dorn, Conrad P.; and Jones, Howard, to Merck & Co., Inc. Substituted mercapto acid amides and their use. 4,329,363, Cl. 424-320.000.

Dornier GmbH: *See—*
Ponitzsch, Werner; Reccius, Helmut; and Fehlings, Herbert, 4,329,092, Cl. 408-11.000.

Dostert, Philippe L.; Imbert, Thierry F.; and Bucher, Bernard P., to Delalande S.A. Certain nor-tropan-8-amine-3-aryl or heteroaryl derivatives. 4,329,466, Cl. 546-125.000.

Dow Chemical Company, The: *See—*
Dergazarian, Thomas E., 4,329,474, Cl. 546-345.000.
Dewald, James R., 4,329,524, Cl. 570-190.000.
Doorakian, George A.; and Schmidt, Donald L., 4,329,480, Cl. 549-78.000.
Habermann, Clarence E., 4,329,500, Cl. 564-128.000.
Lane, George A.; and Rossow, Harold E., 4,329,242, Cl. 252-70.000.
Pews, R. Garth, 4,329,491, Cl. 560-174.000.
Sorenson, Marius W.; Ezzell, Bobby R.; and Pimlott, John R., 4,329,218, Cl. 204-283.000.
Zweigle, Maurice L., 4,329,451, Cl. 536-77.000.

Dow Corning Corporation: *See—*
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Speier, John L., 4,329,483, Cl. 556-436.000.

Downing, Peter M.: *See—*
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Dragerwerk Aktiengesellschaft: *See—*
Leichnitz, Kurt, 4,329,153, Cl. 23-232.00R.

Drilling Development, Inc.: *See—*
Lyons, William C.; and Scurlock, Scot L., 4,328,839, Cl. 138-120.000.

Drinkard, B. M., to Mobil Oil Corporation. Method and apparatus for control and optimization of pyrolysis furnace with multiple parallel passes. 4,329,150, Cl. 23-230.00A.

Druzhinin, Ernest A.; Kubasov, Vladimir L.; Busse-Machukas, Vladimir B.; Lvovich, Florenty I.; Krongauz, Evgeny L.; and Jurkov, Leonid I. Electrode for electrochemical processes. 4,329,219, Cl. 204-290.00F.

Drzewiecki, Tadeusz M., to United States of America, Army. Flueric density and force sensor. 4,328,699, Cl. 73-30.000.

DSO "Pharmachim": *See—*
Dimov, Kiril D.; Vassilev, Nikelay B.; Dimitrov, Dimiter G.; Terlemezyan, Ekaterina I.; Georgieva, Angelina H.; and Dimitrov, Borislav A., 4,329,185, Cl. 134-26.000.

Dubach, Werner: *See—*
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DuBois, Donald W., to PPG Industries, Inc. Electrolytic cell utilizing a transition metal-graphite intercalation compound cathode. 4,329,216, Cl. 204-252.000.

DuBois, R. Clark; and Hamma, John C., to Gradco Dendoki, Inc. Compact sorter. 4,328,963, Cl. 271-293.000.

Dubost, Rene, to Societe Anonyme dite: Les Cables de Lyon. Optical telecommunications cable. 4,329,018, Cl. 350-96.230.

Duffers Associates, Inc.: *See—*
Ferguson, Hugo S., 4,328,661, Cl. 56-13.400.

Dufour, Daniel L., to Monsanto Company. Flame-retardant polymers. 4,329,272, Cl. 524-288.000.

Dujack, George M.: *See—*
Hardman, Bruce B.; and Dujack, George M., 4,329,273, Cl. 524-862.000.

Duly, Alan R.: *See—*
Libertini, Zoltan L.; Duly, Alan R.; and White, Steven D., 4,329,644, Cl. 324-160.000.

Dunfield, John C. G., to Xerox Corporation. Motion damping apparatus. 4,329,633, Cl. 318-612.000.

Dunfield, John C. G.; Gabor, Andrew; and Gnutzman, Keith L., to Xerox Corporation. Motion sensing apparatus. 4,329,634, Cl. 318-685.000.

Dunlevey, Francis M.: *See—*
Mao, George W.; Rao, Purushothama; Marsh, Frederick L.; and Dunlevey, Francis M., 4,329,408, Cl. 429-228.000.

Dunlop Limited: *See—*
Stone, James H.; and Stone, Stephen H., 4,328,971, Cl. 273-408.000.

Dunne, Owen F.: *See—*
Souza, Ronald; and Dunne, Owen F., 4,328,758, Cl. 112-286.000.

Dunstan, Ericson M.; Gervais, William J.; and Gami, Bipin V., to Micropolis Corporation. Low loss brushless DC motor. 4,329,604, Cl. 310-68.00R.

Du Pont de Nemours, E. I., and Company: *See—*
Delbridge, Albert J., 4,328,973, Cl. 277-3.000.
Del Pesco, Thomas W., 4,329,445, Cl. 528-416.000.
Edwards, Donald W.; Gorondy, Emery J.; and Van Roggen, Arend, 4,329,694, Cl. 346-74.300.
Goff, David L.; Yuan, Edward L.; and Proskow, Stephen, 4,329,419, Cl. 430-283.000.
Reardon, Joseph E., 4,329,276, Cl. 524-502.000.
Reardon, Joseph E., 4,329,278, Cl. 524-523.000.
Swerlick, Isadore, 4,329,399, Cl. 428-422.000.
Woods, Thomas S., 4,329,476, Cl. 548-153.000.

Duracell International Inc.: *See—*
Bowden, William L.; Foster, Donald L.; Kuo, Han C.; and Moses, Peter R., 4,329,404, Cl. 429-50.000.

Durante, Lawrence A.: *See—*
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Dworschak, Josef: *See*—
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Dwyer, William F. Suction cup mounted holder for watercraft. 4,328,761, Cl. 114-222.000.

Dyer, Alan: *See*—
McAnespie, Patrick; Dyer, Alan; and Mehta, Bharati J., 4,329,328, Cl. 423-333.000.

Dyer, Anthony O., to BOC Limited. Method for heat treatment of clay and refractory ware. 4,329,142, Cl. 432-19.000.

Dyer, Stanley: *See*—
Applegate, Steven L.; and Dyer, Stanley, 4,329,071, Cl. 400-120.000.

Ealding, Cyril J.; and Jarrett, Graham, to Imperial Chemical Industries Limited. Photographic coated film bases. 4,329,423, Cl. 430-534.000.

East/West Industries, Inc.: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,328,714, Cl. 74-501.00R.

Eastman Kodak Company: *See*—
Brewer, Richard J.; and Wininger, Brice S., 4,329,447, Cl. 536-69.000.
Detty, Michael R.; Goliber, Thomas E.; Murray, Bruce J.; and Perlstein, Jerome H., 4,329,284, Cl. 260-239.00R.
McCombs, Charles A., 4,329,294, Cl. 260-397.400.
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,329,270, Cl. 524-518.000.
Wininger, Brice S., 4,329,446, Cl. 536-69.000.

Eaton Corporation: *See*—
Rohrer, Douglas D., 4,328,881, Cl. 192-58.00B.
Ryczek, Lawrence J.; and Van Zeeland, Donald L., 4,329,730, Cl. 361-100.000.

Ebisawa, Mikio: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,329,434, Cl. 521-27.000.
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Eckes, Peter: *See*—
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Edell, Morton, to Hazel Bishop Industries, Inc. Display clip for securing container so as to preclude tampering therewith. 4,328,894, Cl. 206-461.000.

Edelmann, Hermann: *See*—
Haar, Hans-Peter; Edelmann, Hermann; and Klose, Sigmar, 4,329,062, Cl. 356-414.000.

Edlin, George R.: *See*—
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Edward, Robert M., Jr. Operating cam stop means for hardness tester. 4,328,702, Cl. 73-83.000.

Edwards, Albert, to Baker Perkins Holdings Ltd. Foundry sand mixing machine. 4,329,063, Cl. 366-34.000.

Edwards, Donald W.; Gorondy, Emery J.; and Van Roggen, Arend, to Du Pont de Nemours, E. I., and Company. AC Corona to remove background from the transfer member of a thermomagnetic copier. 4,329,694, Cl. 346-74.300.

Effland, Richard C.; Davis, Larry; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. Spiro[dihydrobenzofuran-piperidines and -pyrrolidines]. 4,329,464, Cl. 546-17.000.

Eglowstein, Ira; and Solender, Peter E., to Interface Systems, Inc. Weighted modulus numbering apparatus. 4,328,746, Cl. 101-72.000.

Egly, Richard S.: *See*—
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Szekacs, Gyorgy, 4,329,614, Cl. 313-115.000.

Eichhorn, Friedrich: *See*—
Schafer, Rolf; and Singh, Sumanjit, 4,329,561, Cl. 219-110.000.

Eichmuller, Karl; and Dubach, Werner, to Createchnic Patent AG. Snail trap. 4,328,637, Cl. 43-121.000.

Eijadi, David A.: *See*—
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Eikonix Corporation: *See*—
Lund, Harold, 4,328,713, Cl. 74-479.000.

Eldon, James B., III, to Knoll International, Inc. Control mechanism for a chair or the like. 4,328,943, Cl. 248-578.000.

Electricite de France: *See*—
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Electrogasdynamics, Inc.: *See*—
Malcolm, David H., 4,328,940, Cl. 244-136.000.

Elektro-Mechanik GmbH: *See*—
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Eli Lilly and Company: *See*—
Hoehn, Marvin M.; and Michel, Karl H., 4,329,472, Cl. 546-270.000.
Holland, Donald R., 4,329,356, Cl. 424-274.000.
Lunn, William H. W., 4,329,454, Cl. 544-026.000.

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Elley, John E., to Schlegel Corporation. Joint former. 4,329,080, Cl. 404-74.000.

Ellis, Robert G.: *See*—
Burkett, Robert A.; Daughton, John W.; Ellis, Robert G.; Wartinger, Raymond C.; and Williamson, Clayton L., Jr., 4,329,046, Cl. 355-77.000.

Elsheikh, Maher Y. A. I., to Dow Corning Corporation. Preparation of mixed cyclotetrasiloxanes and aliphatic chlorides and/or acyl chlorides. 4,329,482, Cl. 556-436.000.

Elward, John R., to Pacific Paperboard Products, Inc. Tab separator element. 4,328,891, Cl. 206-158.000.

Elwing, Hans B. Gel diffusion immunoassay including α-feto protein determination. 4,329,213, Cl. 204-180.00G.

Emerson Electric Co.: *See*—
Robinson, Joseph K.; Vander Graff, Max; and De Marais, Joseph R., 4,328,718, Cl. 74-833.000.

Emhart Industries, Inc.: *See*—
Vana, John H., 4,328,682, Cl. 62-196.00B.

EMI Limited: *See*—
Gillard, Richard G., 4,329,585, Cl. 250-403.000.

Emil Wohlhaupter & Co.: *See*—
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Endo, Keizi: *See*—
Sato, Atushi; Shimizu, Isoo; Endo, Keizi; and Yanagishita, Hitoshi, 4,329,536, Cl. 174-25.00C.

Enerco, Inc.: *See*—
White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,329,202, Cl. 201-27.000.

Energy Research Corporation: *See*—
Baker, Bernard S., 4,329,403, Cl. 429-35.000.

Enertec: *See*—
Le Maguet, Daniel, 4,329,638, Cl. 323-233.000.

Engelhard, Philippe; and Szabo, Georges, to Compagnie Francaise de Raffinage. Catalysts for the hydrotreatment of hydrocarbons and use thereof in the reforming and isomerization of hydrocarbons in the presence of hydrogen. 4,329,258, Cl. 252-441.000.

Enjolras, Hubert, to Commissariat a l'Energie Atomique. Valve with an automatic bleed device. 4,328,827, Cl. 137-512.200.

Erdt, Kurt: *See*—
Dolkemeyer, Wilfried; Erdt, Kurt; Hentges, Rene; and Meisenburg, Ewald, 4,329,329, Cl. 423-461.000.

Eriksson, Fall E. I.: *See*—
Andersson, Per-Erik; and Eriksson, Fall E. I., 4,329,199, Cl. 162-19.000.

Erkfritz, Donald S., to General Electric Company. Floating wedge for use in conjunction with an indexable cutting tool. 4,329,091, Cl. 407-41.000.

Ernst, Horst M.: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., 4,328,999, Cl. 308-6.00C.

Ernst Leitz Wetzlar GmbH: *See*—
Hengst, Alfred, 4,329,013, Cl. 350-36.000.
Machmerth, Herbert; Mann, Georg; and Salzmann, Gerhard, 4,328,711, Cl. 74-194.000.
Reinheimer, Gunter; and Gaul, Norbert, 4,329,014, Cl. 350-89.000.

Eschwey, Helmut; Galinke, Joachim, deceased; Galinke, Renate, nee Jansen, heir; Linden, Heinrich; Wegemund, Bernd; and Wiemers, Norbert, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Method for providing corrosion resistance to metal objects. 4,329,381, Cl. 427-386.000.

Esquire, Inc.: *See*—
Holmes, Kenneth P., 4,329,627, Cl. 315-209.00R.

Esso Resources Canada Ltd.: *See*—
Cymbalisty, Lubomyr M. O.; and Shaw, Robert C., 4,328,710, Cl. 73-863.860.

Ethyl Development Corporation: *See*—
Beardl, James D.; Nelson, Donald J.; Haller, Kirk J.; and Bowers, Kenneth E., 4,328,887, Cl. 198-396.000.

Etschenberg, Eugen: *See*—
Zenk, Meinhard; Etschenberg, Eugen; and Graf, Erich, 4,329,361, Cl. 424-317.000.

Eugster, Peter; and Koller, Stefan, to Ciba-Geigy Corporation. Disperse dye stable to dyeing, and its use for dyeing and printing synthetic and semi-synthetic fibre materials. 4,329,144, Cl. 8-526.000.

Eurocable, S.A.: *See*—
Bretegnier, Pierre; and Fortassy, Rene, 4,328,662, Cl. 57-58.610.

European Space Research Organisation, The: *See*—
Valentian, Dominique R.; Bartoli, Cesare M.; Pfeffer, Heinrich A.; Herhudt v. Rohden, Hans-Joachim; and Stewart, Duncan, 4,328,667, Cl. 60-202.000.

Eusemann, Robert: *See*—
Handke, Gunther; Eusemann, Robert; and Wossner, Felix, 4,328,960, Cl. 267-8.00R.

Evans, Ben E.: *See*—
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,329,465, Cl. 546-072.000.

Evans, Edwin R., to General Electric Company. Method of defoaming crude hydrocarbon stocks with fluorosilicone compounds. 4,329,528, Cl. 585-3.000.

Evans, Joseph H.: *See*—
Middleman, Lee M.; Evans, Joseph H.; and Pettengill, Donald F., 4,329,726, Cl. 361-58.000.

Evanson, Robert, to Northwest Bedding Co. Mattress foundation with vibrator. 4,328,598, Cl. 5-401.000.

Ex-Cell-O Corporation: *See*—
Weller, Peter A.; and Scrivo, Jerry V., 4,328,986, Cl. 293-120.000.

Exxon Research & Engineering Co.: *See*—
Baker, Richard H., 4,329,705, Cl. 357-43.000.
Cikut, John J.; Crane, Irving D., Jr.; and Princiotto, Theodore, Jr., 4,329,234, Cl. 210-752.000.
Habeeb, Jacob J., 4,329,222, Cl. 208-254.00R.
Logie, James A.; and Wilson, Arthur G., 4,329,717, Cl. 358-282.000.

Eymond, Philip R. N.; and Butterworth, Robert M., to Lever Brothers Company. Bleaching detergent compositions. 4,329,245, Cl. 252-102.000.

Eymuller, Helmut: *See—*
Mann, Egon; and Eymuller, Helmut, 4,329,064, Cl. 366-61.000.

Ezzell, Bobby R.: *See—*
Sorenson, Marius W.; Ezzell, Bobby R.; and Pimlott, John R., 4,329,218, Cl. 204-283.000.

Fabcon, Inc.: *See—*
Hanson, David W., 4,329,184, Cl. 134-18.000.

Faber, Paul V.; and Shih, Howard H., to Wilputte Corporation. Multiple stage combustion means for heating slot type coke ovens. 4,329,203, Cl. 202-135.000.

Fagan, John C.: *See—*
Oates, Ronald W., Sr.; and Fagan, John C., 4,328,834, Cl. 137-636.100.

Fager, Orville C. Honeycomb cappings compressor. 4,328,743, Cl. 100-49.000.

Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., to Hoffmann-La Roche Inc. Adrenergic blocking agents. 4,329,289, Cl. 549-449.000.

Falleroni, Charlene A.: *See—*
Neely, James E., Jr.; Moff, Annette; Lin, Chia-Cheng; and Falleroni, Charlene A., 4,329,327, Cl. 423-314.000.

Faltynek, Robert A., to General Electric Company. Heat curable organopolysiloxane compositions. 4,329,274, Cl. 524-862.000.

Farcasiu, Malvina; Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Upgrading of hydrocarbon feedstock. 4,329,221, Cl. 208-214.000.

Farrar, Jack R.: *See—*
Pachmayr, Frank A.; and Farrar, Jack R., 4,328,633, Cl. 42-74.000.

Fecker, Josef: *See—*
Memminger, Gustav; Fecker, Josef; and Flister, Wilfried, 4,328,929, Cl. 242-47.010.

Federici, Giorgio: *See—*
Ricci, Giorgio; and Federici, Giorgio, 4,329,425, Cl. 435-16.000.

Fehlings, Herbert: *See—*
Ponitzsch, Werner; Reccius, Helmut; and Fehlings, Herbert, 4,329,092, Cl. 408-11.000.

Feinbloom, Richard, to Designs for Vision, Inc. Apparatus for increasing the input light intensity to a microscope. 4,329,015, Cl. 350-91.000.

Felcht, Utz-Hellmuth, to Hoechst Aktiengesellschaft. Process for the preparation of 1-oxo-phospholane-chloro-hydrins. 4,329,303, Cl. 260-986.000.

Felten & Guilleaume Carlswerk Aktiengesellschaft: *See—*
Voelker, Wolfgang; Schmitt, Alfons; and Radeck, Fritz, 4,329,377, Cl. 427-9.000.

Fennema, Paul T.: *See—*
LaLama, Samuel J.; and Fennema, Paul T., 4,328,956, Cl. 266-275.000.

Fenstermaker, Roger W., to Phillips Petroleum Company. Production of lignite from underground deposits. 4,328,995, Cl. 299-17.000.

Fenton, Dennis M., to Pfizer Inc. Lactase preparation. 4,329,429, Cl. 435-207.000.

Ferdinand, Irwin J.; Sylvan, Richard; and Baisch, Herbert, to Hirsh Company. Apparatus for effecting a miter cut with a portable circular saw. 4,328,728, Cl. 83-471.300.

Ference, Joseph; Megles, John E., Jr.; and Rittler, Hermann L., to Corning Glass Works. Glass article having a pattern formed in its surface and method. 4,329,400, Cl. 428-426.000.

Ferguson, Hugo S., to Duffers Associates, Inc. Cross flow rotary mower having an axial expansion section. 4,328,661, Cl. 56-13.400.

Ferraro, Joseph P.: *See—*
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,329,193, Cl. 156-162.000.

Ferrokemia Ipari Szovetkezet: *See—*
Szego, Ferenc; and Makk, Antal, 4,329,338, Cl. 424-180.000.

Fichtel & Sachs AG: *See—*
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Fijitsu Limited: *See—*
Yano, Mitsuhiro; Nishi, Hiroshi; Takusagawa, Masahito; and Nishitani, Yorimitsu, 4,329,660, Cl. 372-46.000.

Filipowicz, Edwin A.; Cornell, Robert W.; and Collins, Scott J., to Georgia-Pacific Corporation. Dispenser for folded sheets of flexible material. 4,329,001, Cl. 312-71.000.

Firestone Tire & Rubber Company, The: *See—*
Lohr, Delmar F., Jr., 4,329,439, Cl. 525-180.000.

Fleischhauer, Eugene T.: *See—*
Kunz, Raymond W.; and Fleischhauer, Eugene T., 4,329,567, Cl. 219-222.000.

Flister, Wilfried: *See—*
Memminger, Gustav; Fecker, Josef; and Flister, Wilfried, 4,328,929, Cl. 242-47.010.

Floyd, Paul D.: *See—*
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FMC Corporation: *See—*
Ager, John W.; Harding, Maurice J. C.; and Hatch, Charles E., III, 4,329,293, Cl. 549-470.000.
Plummer, Ernest L., 4,329,518, Cl. 568-807.000.
Rodler, Waldo E., Jr.; and Campbell, Howard H., 4,328,601, Cl. 114-353.000.

Foerster, Gerhard A., to Pyramid Technologies, Inc. Card-rack assembly. 4,328,631, Cl. 40-373.000.

Fogarty, Thomas J. Calibrating dilation catheter. 4,328,811, Cl. 128-774.000.

Fogle, H. William, Jr.: *See—*
Gordon-Clark, Matthew R.; Bullock, Richard H. D., Jr.; and Fogle, H. William, Jr., 4,328,931, Cl. 242-67.500.

Fontana, Giulio. Double side fabric. 4,328,840, Cl. 139-419.000.

Fontana, Giulio. Fabric with double leno warp threads. 4,328,841, Cl. 139-419.000.

Ford Aerospace & Communications Corp.: *See—*
Reisman, Elias; Wilson, S. Kirby; McManigal, Paul G. M.; and Goldberg, Lawrence L., 4,328,938, Cl. 244-3.100.

Forgues, Louis V., to Parks-Cramer Company. Pump for thermoplastic materials with heater means. 4,329,128, Cl. 418-83.000.

Forsberg, John W., to Lubrizol Corporation, The. Carboxylic acid derivatives of alkanol tertiary monoamines and lubricants or functional fluids containing the same. 4,329,249, Cl. 252-34.700.

Fort Lock Corporation: *See—*
Scherbing, Frank J., 4,328,691, Cl. 70-363.000.

Fortassy, Rene: *See—*
Bretegnier, Pierre; and Fortassy, Rene, 4,328,662, Cl. 57-58.610.

Fory, Werner: *See—*
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Foseco International Limited: *See—*
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Foster, Donald L.: *See—*
Bowden, William L.; Foster, Donald L.; Kuo, Han C.; and Moses, Peter R., 4,329,404, Cl. 429-50.000.

Foure, Michel, to Societe Nationale Elf Aquitaine. Organostannic stabilizing compositions for vinyl halide resins. 4,329,279, Cl. 524-180.000.

Francis, Jack E., Jr.: *See—*
Helfrich, Robert C., Jr.; and Francis, Jack E., Jr., 4,329,581, Cl. 250-221.000.

Francis, John E., to Ciba-Geigy Corporation. 1-(Aralkoxyphenyl)-2-(bis-arylalkylamino)-alkanes. 4,329,367, Cl. 424-330.000.

Frater, Georg; and Wenger, Jean, to Hoffmann-La Roche Inc. Propionic acid esters and herbicidal use thereof. 4,329,488, Cl. 560-62.000.

Frederick, Allen H.: *See—*
Priel, Ury; Gray, Jerry D.; and Frederick, Allen H., 4,329,703, Cl. 357-35.000.

Fredriksson, Tommy: *See—*
Hjortsberg, Bengt; and Fredriksson, Tommy, 4,329,569, Cl. 219-535.000.

Freedman, Robert, to Petroleum Physics Corporation. Method for determining distance and direction from an open well to a cased well using resistivity and directional survey data. 4,329,647, Cl. 324-323.000.

Freeman, Leon D.: *See—*
Sawyer, Philip N.; and Freeman, Leon D., 4,329,290, Cl. 549-316.000.

French, J. Barry; and Dawson, Peter H. Tandem mass spectrometer with synchronized RF fields. 4,329,582, Cl. 250-292.000.

Freudenstein, Georg: *See—*
Poque, Dionysius J.; Freudenstein, Georg; and Lorenz, Horst, 4,328,852, Cl. 152-359.000.

Frickel, Fritz-Frieder; von Philipsborn, Gerda; Mueller, Claus D.; and Lenke, Dieter, to BASF Aktiengesellschaft. Piperidine derivatives of 3-hydroxy-thiophene-2-carboxylic acid esters and pharmaceutical formulations containing these compounds. 4,329,352, Cl. 424-267.000.

Friedman, Robert H., to Getty Oil Company. Methods for recovery of oil. 4,328,864, Cl. 166-274.000.

Friedman, William D.: *See—*
Marx, Alvin J.; and Friedman, William D., 4,328,801, Cl. 128-214.00E.

Fries, Bernard A., to Chevron Research Company. Leak detection method and apparatus. 4,328,700, Cl. 73-40.700.

Frieze, Allan S.: *See—*
Bowman, Peter; and Frieze, Allan S., 4,328,615, Cl. 30-32.000.

Froom, Thomas W., to Rendoll Paper Corporation. Folding ice-cream carton, carton blank, and method. 4,328,656, Cl. 53-458.000.

Frost, John J., to Oregon Etablissement fur Patentverwertung. Hand grenade with wave-forming means between chambers. 4,328,755, Cl. 102-486.000.

Fuji Photo Optical Co., Ltd.: *See—*
Numata, Saburo, 4,329,028, Cl. 354-23.00D.

Fuji Seiko Kabushiki Kaisha: *See—*
Sanada, Kokichi, 4,329,074, Cl. 400-216.500.

Fujii, Minoru. Pressurized dispensers for dispensing products utilizing a pressure transfer fluid. 4,328,843, Cl. 141-1.000.

Fujikawa, Tetsuzo; Takada, Toshiyuki; and Tamba, Shinichi, to Kawasaki Jukogyo Kabushiki Kaisha. Cooling system of liquid-cooled multicylinder engine. 4,328,769, Cl. 123-41.470.

Fujitsu Limited: *See—*
Sakurai, Junji; and Miyasaka, Kiyoshi, 4,329,704, Cl. 357-41.000.

Fujiwara, Akiko; Hoshino, Tatsuo; and Tazoe, Masaaki, to Hoffmann-La Roche Inc. Anthracyclinones and derivatives thereof. 4,329,339, Cl. 424-180.000.

Fujiwara, Hitoshi; and Kawabata, Yousei, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Character ring-selecting type printer. 4,328,747, Cl. 101-93.170.

Fujiwara, Toshihide; and Kaneko, Nobutaka, to Olympus Optical Co., Ltd. Method for detecting samples. 4,329,591, Cl. 250-548.000.

Fukai, Masakazu: *See—*
Ishihara, Shin-ichiro; Mori, Koshiro; Tanaka, Tsuneo; Nagata, Seiichi; and Fukai, Masakazu, 4,329,699, Cl. 357-2.000.

Fukami, Akira: *See—*
Kawai, Hisasi; Morino, Seiji; Fukami, Akira; and Hamaguchi, Hiroshi, 4,328,771, Cl. 123-179.0BG.

Fukino, Kunihiro; and Ishizaka, Sunao, to Nippon Kogaku K.K. Signal transmitting device of an intermediate lens barrel of a camera. 4,329,040, Cl. 354-286.000.

Fukuoka, Yohei: *See—*
Tamura, Nobuhiro; Fukuoka, Yohei; Nishikido, Joji; Yamamatsu, Setsuo; and Suzuki, Yoshio, 4,329,462, Cl. 544-387.000.

Funderburk, James O., Jr.: *See—*
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Furukawa Electric Co., Ltd., The: *See—*
Tanaka, Yasuzo; and Furuto, Yoshio, 4,329,539, Cl. 174-128.00S.

Furuto, Yoshio: *See—*
Tanaka, Yasuzo; and Furuto, Yoshio, 4,329,539, Cl. 174-128.00S.

Fymat, Alain L.: *See—*
United States of America, National Aeronautics and Space Administration; and Fymat, Alain L., 4,329,053, Cl. 356-336.000.

G. D. Searle & Co.: *See—*
Chorvat, Robert J., 4,329,295, Cl. 260-397.200.

G. D. Societa per Azioni: *See—*
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Gabor, Andrew: *See—*
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GAF Corporation: *See—*
Chakrabarti, Paritosh M.; and Kirchner, Darrell G., 4,329,268, Cl. 524-166.000.
Resnick, Bruce M., 4,329,360, Cl. 424-314.000.

Gagnol, Jean P.: *See—*
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Gahr, Haroid: *See—*
Wohlhaupter, Gerhard; and Gahr, Harold, 4,328,722, Cl. 82-2.00E.

Gale, James A. S., to Kenneth E. Beswick Limited. Electrical fuse holders. 4,329,006, Cl. 339-126.00R.

Galinke, Joachim, deceased: *See—*
Eschwey, Helmut; Galinke, Joachim, deceased; Galinke, Renate, nee Jansen, heir; Linden, Heinrich; Wegemund, Bernd; and Wiemers, Norbert, 4,329,381, Cl. 427-386.000.

Galinke, Renate, nee Jansen, heir: *See—*
Eschwey, Helmut; Galinke, Joachim, deceased; Galinke, Renate, nee Jansen, heir; Linden, Heinrich; Wegemund, Bernd; and Wiemers, Norbert, 4,329,381, Cl. 427-386.000.

Gall, George R.; and Gates, Charles R. Folding screen for light-permeable skylights and the like. 4,328,853, Cl. 160-183.000.

Gallizia, Achille, to Industrie Pirelli S.p.A. Flat extruder head. 4,329,133, Cl. 425-114.000.

Gami, Bipin V.: *See—*
Dunstan, Ericson M.; Gervais, William J.; and Gami, Bipin V., 4,329,604, Cl. 310-68.00R.

Gander, Robert J.: *See—*
Nashed, Wilson; Rovee, David T.; and Gander, Robert J., 4,329,366, Cl. 424-324.000.

Ganz, Rudolph V., to Affiliated Hospital Products, Inc. Method of making gloves. 4,329,312, Cl. 264-306.000.

Garbell, Maurice A. Ventilated sound barrier for window openings. 4,328,650, Cl. 52-202.000.

Gardy, Victor R.: *See—*
Nelson, Lawrence; Gardy, Victor R.; Habersthol, August J.; Manucuso, Eltore J., Jr.; and O'Brien, John F., 4,328,737, Cl. 89-33.0CA.

Garnett, Donald W., to Olofsson Corporation, The. Adjustable tool compensating arm. 4,328,723, Cl. 82-36.00R.

Gartner, Jurij; Hengl, Helmut; Sixt, Karl; and Woltmann, Reinhard, to Bayerische Motoren Werke A.G. Casting core for an intake pipe assembly for an internal combustion engine. 4,328,854, Cl. 164-369.000.

Gassenhuber, Helmut: *See—*
Triller, Adolf; and Gassenhuber, Helmut, 4,329,737, Cl. 362-32.000.

Gates, Charles R.: *See—*
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Gates Rubber Company, The: *See—*
Tone, Robert P., 4,328,879, Cl. 180-219.000.

Gath, Nicolas. Leakage current circuit breaker responsive to direct-current leakage currents of both polarities. 4,329,668, Cl. 335-18.000.

Gaul, Norbert: *See—*
Reinheimer, Gunter; and Gaul, Norbert, 4,329,014, Cl. 350-89.000.

Gautier, Patrick: *See—*
Bernhart, Claude; Gagnol, Jean P.; and Gautier, Patrick, 4,329,343, Cl. 424-248.540.

Gavens, Paul D.; and Rochefort, Malcolm P., to Imperial Chemical Industries Limited. Olefine polymerization catalyst and the production and use thereof. 4,329,252, Cl. 252-429.00B.

Gayer, Melvin D.: *See—*
White, Jack D., Jr.; and Gayer, Melvin D., 4,329,192, Cl. 156-138.000.

Geary, William C.: *See—*
Heydrich, Hans; Woods, Melvin E.; and Geary, William C., 4,328,772, Cl. 123-193.0CH.

Gebler, James M. Wind instrument key. 4,328,734, Cl. 84-380.00R.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Jahn, Dieter, 4,328,996, Cl. 299-43.000.

Gebr. Poppelmann, Inhabber Josef Poppelmann: *See—*
Sieve, Gregor, 4,328,649, Cl. 52-202.000.

Geczy, Bela A.: *See—*
Tschirky, John E.; and Geczy, Bela A., 4,329,127, Cl. 418-48.000.

General Dynamics, Pomona Division: *See—*
Shores, Marvin W., 4,328,792, Cl. 126-438.000.

General Electric Company: *See—*
Bochan, John, 4,328,600, Cl. 8-159.000.
Borman, Willem F. H., 4,329,444, Cl. 528-272.000.
Brunelle, Daniel J., 4,329,443, Cl. 528-180.000.
Cooley, Edmund A.; Long, Robert; and Ness, Phillip D., 4,329,094, Cl. 408-77.000.
Crivello, James V.; and Lam, Julia H., 4,329,300, Cl. 260-440.000.
Crivello, James V., 4,329,306, Cl. 264-137.000.
Cummins, James R., Jr., 4,328,666, Cl. 60-39.09D.
Erkfritz, Donald S., 4,329,091, Cl. 407-41.000.
Evans, Edwin R., 4,329,528, Cl. 585-3.000.
Faltynek, Robert A., 4,329,274, Cl. 524-862.000.
Hardman, Bruce B.; and Dujack, George M., 4,329,273, Cl. 524-862.000.
Helfrich, Robert C., Jr.; and Francis, Jack E., Jr., 4,329,581, Cl. 250-221.000.
Kiernan, James G.; and Leonard, James G., 4,328,824, Cl. 137-99.000.
Kim, Bang M., 4,329,224, Cl. 210-709.000.
Kimberlin, Dan W., 4,329,683, Cl. 340-679.000.
Latos, Edward L., 4,329,734, Cl. 362-13.000.
Markezich, Ronald L., 4,329,287, Cl. 549-241.000.
Nelson, Lawrence; Gardy, Victor R.; Habersthol, August J.; Manucuso, Eltore J., Jr.; and O'Brien, John F., 4,328,737, Cl. 89-33.0CA.
Ohmstedt, Harry O.; Ruth, William H.; and Krulls, Gerd E., 4,329,611, Cl. 310-227.000.
Park, John N., 4,329,630, Cl. 318-258.000.
Petersen, Louis P., 4,329,484, Cl. 556-442.000.
Premerlani, William J., 4,329,727, Cl. 361-80.000.
Staats, James E., 4,329,557, Cl. 219-10.55F.
Stamp, Custis L., Jr.; and Herzog, Rollie R., 4,328,680, Cl. 62-155.000.
Wagner, James B.; and Priluck, David M., 4,329,592, Cl. 290-40.00R.
Webb, Jimmy L.; and Mehta, Bharat M., 4,329,291, Cl. 549-241.000.
Webb, Jimmy L., 4,329,292, Cl. 549-241.000.
Webb, Jimmy L., 4,329,496, Cl. 562-468.000.
Zamek, Otto S.; Pauze', Denis R.; and Jablonski, Richard J., 4,329,397, Cl. 428-379.000.

General Foods Corporation: *See—*
Kolor, Michael G., 4,329,372, Cl. 426-535.000.

General Motors Corporation: *See—*
Angi, Donald F.; and Cornwell, William D., Jr., 4,329,605, Cl. 310-68.00R.
Bishai, Macram N., 4,328,825, Cl. 137-172.000.
Bungo, Edward M., 4,329,009, Cl. 339-223.00R.
Hood, Richard A.; Greig, Dale C.; and Nemecek, Ralph E., 4,328,630, Cl. 37-129.000.
Leistra, Philip W., Jr.; and Barnes, Robert M., 4,328,612, Cl. 29-802.000.
Loose, Richard D., 4,328,933, Cl. 242-107.200.
Mort, Dewey F., 4,328,669, Cl. 60-397.000.
Perkins, William J., 4,328,945, Cl. 249-67.000.
Prewitt, Thomas A., 4,329,691, Cl. 343-713.000.
Shellhause, Ronald L., 4,328,883, Cl. 192-85.0CA.
Tracy, Joseph C.; and Herbst, Jan F., 4,328,768, Cl. 123-1.00A.
Woodward, Ronald O., 4,328,773, Cl. 123-198.0DB.

General Scanning, Inc.: *See—*
Montagu, Jean I., 4,329,606, Cl. 310-71.000.

General Tire & Rubber Company, The: *See—*
Arnason, Sigurdur I.; and Kleese, Edward J., 4,329,134, Cl. 425-157.000.

George, Raymond D., to Foseco International Limited. Alkali metal silicate binder compositions. 4,329,177, Cl. 106-38.350.

Georgia-Pacific Corporation: *See—*
Filipowicz, Edwin A.; Cornell, Robert W.; and Collins, Scott J., 4,329,001, Cl. 312-71.000.

Georgieva, Angelina H.: *See—*
Dimov, Kiril D.; Vassilev, Nikelay B.; Dimitrov, Dimiter G.; Terlemezyan, Ekaterina I.; Georgieva, Angelina H.; and Dimitrov, Borislav A., 4,329,185, Cl. 134-26.000.

Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 4,328,726, Cl. 83-39.000.

Gerber, Robert F., Jr. Dialing system for teleprinter. 4,329,541, Cl. 178-3.000.

Gerig, John S. Counting with plural electric fields. 4,329,571, Cl. 235-92.0PK.

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Dunstan, Ericson M.; Gervais, William J.; and Gami, Bipin V., 4,329,604, Cl. 310-68.00R.

Getty Oil Company: *See—*
Friedman, Robert H., 4,328,864, Cl. 166-274.000.

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Giani, Roberto: *See—*
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Gibbs & Hill, Inc.: *See—*
Scoates, Kenneth D., 4,329,649, Cl. 324-438.000.

Gibson, Jack E. Pipeline building method and apparatus. 4,328,608, Cl. 29-237.000.
Gibson, Jack E. Positive seal steel coupling apparatus and method therefor. 4,328,983, Cl. 285-382.000.
Giffen, William M., Jr.: *See*—
Taisma, Herbert; and Giffen, William M., Jr., 4,329,401, Cl. 428-462.000.
Gilbert, Everett E.; and Sollott, Gilbert P., to United States of America, Army. 1,3,5,7-Tetranitroadamantane and process for preparing same. 4,329,522, Cl. 568-941.000.
Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., to Procter & Gamble Company, The. Alkaline dishwasher detergent. 4,329,246, Cl. 252-103.000.
Gillard, Richard G., to EMI Limited. X-ray tube arrangements. 4,329,585, Cl. 250-403.000.
Gillet, Roger, to Alsthom-Atlantique; and Electricite de France. Superconducting rotor. 4,329,602, Cl. 310-52.000.
Gillette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, to Brammall, Inc. Inside, outside honing tool. 4,328,647, Cl. 51-338.000.
Gillis, Michael E. Shiplift apparatus. 4,329,082, Cl. 405-3.000.
Gingerich, Richard G. W.; and Scheithauer, Richard A., to GTE Products Corporation Method for producing cobalt metal powder. 4,329,169, Cl. 75-0.5AA.
Glaxo Group Limited: *See*—
Brodie, Alastair C.; and Wetherill, Lewis A., 4,329,453, Cl. 544-25.000.
Globe Valve Corporation: *See*—
Greer, Larry G., 4,328,830, Cl. 137-625.400.
Glover, Charles G., to Lodge & Shipley Company, The. Transfer apparatus for pattern-changing mechanism. 4,329,112, Cl. 414-751.000.
Glowacki, Pierre A.: *See*—
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,329,113, Cl. 415-116.000.
Glucksman, Dov Z. Hand held hair dryer. 4,328,818, Cl. 132-9.000.
Gluskin, Richard S., to SPS Technologies, Inc. Power tool speed and torque control mechanism. 4,328,871, Cl. 173-12.000.
Gnutzman, Keith L.: *See*—
Dunfield, John C. G.; Gabor, Andrew; and Gnutzman, Keith L., 4,329,634, Cl. 318-685.000.
Godbersen, Byron L. Adjustable length boat trailer. 4,329,108, Cl. 414-534.000.
Goertler, Horst: *See*—
Betsch, Helmut; Goertler, Horst; Liedtke, Karl-Heinz; Prohaska, Hans; and Rachner, Horst, 4,329,631, Cl. 318-466.000.
Goff, David L.; Yuan, Edward L.; and Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Polymeric heat resistant photopolymerizable composition for semiconductors and capacitors. 4,329,419, Cl. 430-283.000.
Goldberg, Lawrence L.: *See*—
Reisman, Elias; Wilson, S. Kirby; McManigal, Paul G. M.; and Goldberg, Lawrence L., 4,328,938, Cl. 244-3.100.
Goldie, Harry, to United States of America, Air Force. Signal injection circuit for radar gain and noise tests. 4,329,688, Cl. 343-17.700.
Goldschmidt, Robert E.; Ku, Charles C.; and Townzen, David A., to Kaye Instruments, Inc. Method of and apparatus for data recording and the like. 4,329,693, Cl. 346-33.0TP.
Goldstein, Robert P.: *See*—
Plantes, William J.; Goldstein, Robert P.; and Wolfe, Jerome K., 4,329,211, Cl. 204-149.000.
Goliber, Thomas E.: *See*—
Detty, Michael R.; Goliber, Thomas E.; Murray, Bruce J.; and Perlstein, Jerome H., 4,329,284, Cl. 260-239.00R.
Golze, Richard R. Roof top carrier. 4,329,100, Cl. 414-21.000.
Gonwa, Charles J.; Baker, Kenneth L.; and Sieloff, Ronald A., to Maremont Corporation. Method and apparatus for forming a heat shield plate. 4,328,696, Cl. 72-389.000.
Gonzalez, Eduardo B. Automatic depth compensating system for drill bit lubrication. 4,328,873, Cl. 175-228.000.
Goodall, Brian L.; Van der Nat, Adrianus A.; and Sjardijn, Willem, to Shell Oil Company. Olefin polymerization catalyst component and composition and method of preparation. 4,329,253, Cl. 252-429.00B.
Goodman, Graeme D., to Commonwealth of Australia. Time delay device. 4,328,754, Cl. 102-277.000.
Goodrich, Richard B.; and Moulton, Richard J., to Hexcel Corporation. Prepreg material having increased surface tack. 4,329,387, Cl. 428-196.000.
Gordon-Clark, Matthew R.; Bullock, Richard H. D., Jr.; and Fogle, H. William, Jr., to Scott Paper Company. Automatic speed control of a rewinder. 4,328,931, Cl. 242-67.500.
Gorkov, Petr I. Planetary crank gearing. 4,328,715, Cl. 74-674.000.
Gorondy, Emery J.: *See*—
Edwards, Donald W.; Gorondy, Emery J.; and Van Roggen, Arend, 4,329,694, Cl. 346-74.300.
Gossalter, Rene, to Swisscal Holding S.A. Tube bundle heat exchanger. 4,328,862, Cl. 165-158.000.
Gotho, Mitsuhiro; Ikeda, Masayuki; Komatsu, Hidetoshi; and Naka, Takahiro, to Kabushiki Kaisha Suwa Seikosha. Electronic tone generator. 4,328,731, Cl. 84-1.010.
Goto, Kenji: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,328,779, Cl. 123-416.000.
Goudy, Paul R., Jr., to Landis, Bruce J.; Landis, Kenneth J.; and Goudy, Paul R., Jr., a part interest. Fluid mixer. 4,329,067, Cl. 366-182.000.
Gould Inc.: *See*—
Mao, George W.; Rao, Purushothama; Marsh, Frederick L.; and Dunlevey, Francis M., 4,329,408, Cl. 429-228.000.
McConnell, Lorne D., 4,329,552, Cl. 200-147.00R.
Reilly, Edward J., 4,329,635, Cl. 318-696.000.
Gradco Dendoki, Inc.: *See*—
DuBois, R. Clark; and Hamma, John C., 4,328,963, Cl. 271-293.000.
Gradowski, Stephen: *See*—
Hyner, Jacob; Gradowski, Stephen; and Maestrone, Thomas F., 4,329,402, Cl. 428-621.000.
Graf, Erich: *See*—
Zenk, Meinhard; Etschenberg, Eugen; and Graf, Erich, 4,329,361, Cl. 424-317.000.
Graf, Rudolf, to Sprecher & Schuh AG. Gas-blast switch. 4,329,553, Cl. 200-148.00A.
Graham, Scott W. Manure pit stirring system. 4,329,069, Cl. 366-270.000.
Graham, Tommy E.: *See*—
Dobo, Emerick J.; and Graham, Tommy E., 4,329,157, Cl. 55-16.000.
Granda, Edward J.: *See*—
Klemarczyk, Philip T.; Schmitt, Frederick L.; Granda, Edward J.; and Luccarelli, Domenick, Jr., 4,329,373, Cl. 426-538.000.
Grandin, Roland E.: *See*—
Milligan, Barton; and Grandin, Roland E., 4,329,501, Cl. 564-305.000.
Grange, Edward W.: *See*—
Henry, David W.; Ryan, Kenneth J.; and Grange, Edward W., 4,329,355, Cl. 424-272.000.
Graser, Earl J., to Johns-Manville Corporation. Picnic cooler container. 4,328,923, Cl. 229-33.000.
Grassi, Francesco, to Societa Italiana Telecomunicazioni Siemens S.p.A. Frame for storing printed-circuit boards or the like. 4,328,898, Cl. 211-41.000.
Graube, Andrejs: *See*—
Wreede, John E.; and Graube, Andrejs, 4,329,409, Cl. 430-1.000.
Gray, Jerry D.: *See*—
Priel, Ury; Gray, Jerry D.; and Frederick, Allen H., 4,329,703, Cl. 357-35.000.
Gray, John H. Automatic bale wagon. 4,329,102, Cl. 414-24.500.
Green, Allen P.; and Grey, Donald M., to Sperry Corporation. Bale handling apparatus. 4,329,101, Cl. 414-24.500.
Green, Andrew; Rogers, Charles W.; and Upton, Clarence D., to Composite Technology, Inc. Method for constructing fiberglass articles. 4,329,194, Cl. 156-179.000.
Greene, Carl B., Jr.; and Greene, Carl B., III. Duct structure with reinforced end flanges. 4,328,981, Cl. 285-286.000.
Greene, Carl B., III: *See*—
Greene, Carl B., Jr.; and Greene, Carl B., III, 4,328,981, Cl. 285-286.000.
Greene, Leonard B. Coded optical identification system. 4,329,573, Cl. 235-454.000.
Greenwell, Robert P.: *See*—
Becktel, Robert L.; Greenwell, Robert P.; and Tilling, Basil B., 4,328,844, Cl. 141-302.000.
Greer, Larry G., to Globe Valve Corporation. Fluid mixing valve. 4,328,830, Cl. 137-625.400.
Gregorian, Roubik; and Suzuki, Toshiro, to American Microsystems, Inc. Switched-capacitor cosine filter. 4,329,599, Cl. 307-520.000.
Gregory, Jack T. Force delivering hand tool. 4,329,121, Cl. 417-270.000.
Greig, Dale C.: *See*—
Hood, Richard A.; Greig, Dale C.; and Nemecek, Ralph E., 4,328,630, Cl. 37-129.000.
Grein, Lutz: *See*—
Reimpell, Uwe; Grein, Lutz; Reiter, Reinhard; and Stark, Friedrich, 4,328,947, Cl. 251-80.000.
Greivenkamp, John E., Jr.: *See*—
Barrett, Harrison H.; Swindell, William; and Greivenkamp, John E., Jr., 4,329,588, Cl. 250-445.00T.
Gresham Michael E.: *See*—
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Grey, Donald M.: *See*—
Green, Allen P.; and Grey, Donald M., 4,329,101, Cl. 414-24.500.
Gringarten, Alain C., to Schlumberger Technology Corporation. Method of determining characteristics of a fluid producing underground formation. 4,328,705, Cl. 73-155.000.
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., to Merrell Dow Pharmaceuticals Inc. 5-(4-Phenyl 1-piperidinyl)methyl-2,3-dihydro-2-oxo-1H-imidazole-4-carboxylic acid derivatives. 4,329,470, Cl. 546-210.000.
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., to Merrell Dow Pharmaceuticals Inc. 4-(4-Phenyl-1-piperidinyl)methyl-5-acyl-1,3-dihydro-2H-imidazol-2-ones. 4,329,471, Cl. 546-210.000.
Gronka, Edward A.: *See*—
Allaroyce, Gerald M.; Moskalczak, Ronald N.; and Gronka, Edward A., 4,329,648, Cl. 324-404.000.
Gross, Francis M.: *See*—
White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,329,202, Cl. 201-27.000.
Gross, Franz; and Birnbreier, Hermann, to Brown, Boveri & Cie AG. Electrochemical storage battery. 4,329,407, Cl. 429-101.000.
Gross, Josef; and Barkow, William H., to RCA Corporation. Alignment-insensitive self-converging in-line color display. 4,329,671, Cl. 335-213.000.

Grumman Aerospace Corporation: *See*—
Kress, Robert W., 4,329,115, Cl. 416-11.000.
Gschwend, Rene, to Hatebur Umformmaschinen. Method of and apparatus for automatically discarding the front and rear ends of bars of material. 4,328,725, Cl. 83-27.000.
GTE Products Corporation: *See*—
Barakitis, Nikolaos; and Cohen, Sheppard, 4,329,621, Cl. 315-47.000.
Gingerich, Richard G. W.; and Scheithauer, Richard A., 4,329,169, Cl. 75-0.5AA.
Kemr, Miro; and Mizuhara, Howard, 4,329,271, Cl. 524-386.000.
Gulf Canada Resources Inc.: *See*—
Cymbalisty, Lubomyr M. O.; and Shaw, Robert C., 4,328,710, Cl. 73-863.860.
Gulf Research & Development Company: *See*—
Beach, David L.; Lunden, Richard W.; and Zambelli, Adolfo, 4,329,255, Cl. 252-429.00B.
Gumberich, Clinton L.; Visioli, Armando J., Jr.; and Kunz, Richard H., to Ohaus Scale Corporation. Digital weighing scale with selectable computational parameters. 4,328,874, Cl. 177-25.000.
Gunderman, Robert J.; and Riley, Michael W., to United States of America, Interior. Multilayer pressure vent for explosion proof enclosures. 4,328,901, Cl. 220-88.00A.
Guthrie, Robert W.: *See*—
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,329,289, Cl. 549-449.000.
Gutierrez, Manuel, to American Beverage Machinery, Inc., a part interest. Precast concrete constructions. 4,328,651, Cl. 52-293.000.
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Homeier, Edwin H.; Imai, Tamotsu; Mackowiak, David E.; and Guzolek, Catherine E., 4,329,521, Cl. 568-909.000.
H. Walli Gesellschaft m.b.H. Papier- und Zellstoffwattefabrik: *See*—
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Haag, Werner O.; and Young, Lewis B., to Mobil Oil Corporation. Co-production of 2-alkanones and phenols. 4,329,509, Cl. 568-385.000.
Haar, Hans-Peter; Edelmann, Hermann; and Klose, Sigmar, to Boehringer Mannheim GmbH. Polychromatic photometer. 4,329,062, Cl. 356-414.000.
Haarmann, Walter: *See*—
Muller, Erich; Nickl, Josef; Roch, Josef; Narr, Berthold; Haarmann, Walter; and Weisenberger, Johannes M., 4,329,347, Cl. 424-251.000.
Haas, Everett L. Vibrating nail trimmer. 4,328,819, Cl. 132-73.600.
Habeeb, Jacob J., to Exxon Research & Engineering Co. Method for selectively removing basic nitrogen compounds from lube oils using transition metal halides or transition metal tetrafluoroborates. 4,329,222, Cl. 208-254.00R.
Habermann, Clarence E., to Dow Chemical Company, The. Catalysts for the hydration of nitriles to amides. 4,329,500, Cl. 564-128.000.
Habermehl, Diethard; and Kucharzyk, Werner, to Bergwerksverband GmbH; and Didier Engineering GmbH. Method of and device for heating finely divided solid particles in conveying ducts. 4,329,141, Cl. 432-17.000.
Haberstholl, August J.: *See*—
Nelson, Lawrence; Gardy, Victor R.; Haberstholl, August J.; Manucuso, Eltore J., Jr.; and O'Brien, John F., 4,328,737, Cl. 89-33.0CA.
Habu, Takeshi: *See*—
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Hach Chemical Company: *See*—
Schoonover, David J.; and Larson, Paul, 4,329,149, Cl. 23-230.00R.
Hacker, Chuck. Protective pad for the thumb hole of a bowling ball. 4,328,968, Cl. 273-63.00B.
Hackman, Edward B.; Zeagler, Larry D.; McLaughlin, James S.; and Peabody, Carl M., to Celanese Corporation. Hydroformylation process improved by choice of reaction solvent and control of product stripping parameters. 4,329,511, Cl. 568-454.000.
Hadley, Michael S., to Beecham Group Limited. 4-(Phenylalkyl)piperazine-1-carboxamides. 4,329,344, Cl. 424-250.000.
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McDonald, Gerald H.; and Hagen, Donald R., 4,329,676, Cl. 338-198.000.
Hagenlocher, Walter; Hesse, Heinz; Sohnle, Rudiger; Kleebaur, Karl; and Kugel, Christoph, to Robert Bosch GmbH. Mounting for a belt-driven generator. 4,329,608, Cl. 310-91.000.
Haggar, Phyllis, administratrix: *See*—
Haggar, Theodore, deceased; and Haggar, Phyllis, administratrix, 4,328,912, Cl. 222-212.000.
Haggar, Theodore, deceased; and by Haggar, Phyllis, administratrix. Self-contained valved package. 4,328,912, Cl. 222-212.000.
Hajos, Zoltan G., to Ortho Pharmaceutical Corporation. (1RS,4SR,5RS)-4-(5-Hydroxy-4,8-dimethyl-8-nonenyl)-4-methyl-3,8-dioxabicyclo[3.2.1]octane-1-acetic acid. 4,329,288, Cl. 549-363.000.
Hakes, Gary A.; and McCracken, William E., to Lee Norse Company. Mining apparatus and method. 4,328,994, Cl. 299-11.000.
Hakkinen, Taisto. Respiration pacemaking valve for resuscitation apparatus such as respirators. 4,328,796, Cl. 128-200.140.
Halcon SD Group, Inc., The: *See*—
Moy, David, 4,329,512, Cl. 568-484.000.
Hale, David J., to Brunswick Corporation. Internal combustion engine with die castable loop transfer system. 4,328,770, Cl. 123-59.00B.
Hall, Edward N., to Chromalloy American Corporation. Wax control in oil wells using a thermal syphon system. 4,328,865, Cl. 166-302.000.
Hall, William K., Jr. Air-handling unit. 4,328,926, Cl. 236-13.000.
Hallenbeck, Victor L., to B. F. Goodrich Company, The. Outside tire paint. 4,329,265, Cl. 524-496.000.
Haller, Kirk J.: *See*—
Beardl, James D.; Nelson, Donald J.; Haller, Kirk J.; and Bowers, Kenneth E., 4,328,887, Cl. 198-396.000.
Halliburton Company: *See*—
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Hamada, Seiya: *See*—
Takeda, Toshio; Amano, Takehisa; Isii, Sigeki; and Hamada, Seiya, 4,328,732, Cl. 84-1.170.
Hamaguchi, Hiroshi: *See*—
Kawai, Hisasi; Morino, Seiji; Fukami, Akira; and Hamaguchi, Hiroshi, 4,328,771, Cl. 123-179.0BG.
Hamamatsu, Seiji, to Tokico Ltd. Vacuum servo booster. 4,328,738, Cl. 91-376.00R.
Hamano, Tadayasu, to Tokyo Shibaura Denki Kabushiki Kaisha. High voltage transformer for AC-DC converter. 4,329,674, Cl. 336-92.000.
Hamma, John C.: *See*—
DuBois, R. Clark; and Hamma, John C., 4,328,963, Cl. 271-293.000.
Hammerstrom, Knut: *See*—
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Hampton, Juandine B. Work and method for inclusion of three or more cords of different colors into a cavendoli type macrame pattern. 4,328,984, Cl. 289-1.200.
Hanahan, Donald J.; and Pinckard, R. Neal, to Board of Regents, The University of Texas System. Synthetic phosphoglycerides possessing platelet activating properties. 4,329,302, Cl. 260-925.000.
Hanamura, Yoshihiko: *See*—
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Hanberger, Bror A. S.: *See*—
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Handke, Gunther; Eusemann, Robert; and Wossner, Felix, to Fichtel & Sachs AG. Fluid damping unit featuring combined fluidic and spring damping characteristics. 4,328,960, Cl. 267-8.00R.
Hane, Toshioki: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,329,434, Cl. 521-27.000.
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,329,435, Cl. 521-38.000.
Hanke, David E., to Crown Zellerbach Corporation. Surface-coated, unsize-pressed cellulosic sheet and method for making same. 4,329,394, Cl. 428-342.000.
Hansen, Glen D.: *See*—
Buschbom, Floyd E.; Hansen, Glen D.; Paulson, Jerome T.; and Anderson, Clifton W., 4,329,105, Cl. 414-316.000.
Hansen, Guenter; Kermer, Wolf-Dieter; and Stuck, Jochen-Wilfried, to BASF Aktiengesellschaft. Dye mixtures, and their use in dyeing polyesters. 4,329,148, Cl. 8-639.000.
Hansen, Uwe-Jens: *See*—
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Hanson, David W., to Fabcon, Inc. Rock aggregate core material washing and recycling. 4,329,184, Cl. 134-18.000.
Hanson, Palmer C. Extension assembly for a work bench. 4,328,846, Cl. 144-287.000.
Hanson, Thomas E.: *See*—
McDonough, Robert M.; Hanson, Thomas E.; Brill, Richard H.; and Oates, Ronald W., 4,328,740, Cl. 99-295.000.
Hanula, Richard M., to Midland-Ross Corporation. Rotary coupler with improved pin bearing. 4,328,900, Cl. 213-62.00A.
Hardesty, George K. C.: *See*—
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Harding, Maurice J. C.: *See*—
Ager, John W.; Harding, Maurice J. C.; and Hatch, Charles E., III, 4,329,293, Cl. 549-470.000.
Hardman, Bruce B.; and Dujack, George M., to General Electric Company. Self-bonding silicone rubber compositions. 4,329,273, Cl. 524-862.000.
Hardmark, Ragnar M.; and Hanberger, Bror A. S., to Saab-Scania Aktiebolag. Apparatus for measuring the evenness of a road surface. 4,328,622, Cl. 33-174.00P.
Hardt, Jean, to Swiss Aluminium Ltd. Metal can with membrane type closure. 4,328,905, Cl. 220-258.000.
Harfenist, Morton, to Burroughs Wellcome Co. Flukicidal compounds. 4,329,365, Cl. 424-324.000.
Harford, Jack R., to RCA Corporation. Television automatic gain control system. 4,329,713, Cl. 358-174.000.
Harigaya, Isao: *See*—
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,329,033, Cl. 354-25.000.
Harikae, Nobuyuki: *See*—
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Harrington, Alan L.; and Allison, Richard, to TRW Inc. Method for manufacture of an interdigitated collector structure utilizing etch and refill techniques. 4,328,611, Cl. 29-580.000.
Harris, Denis J.: *See*—
Smith, Arthur R.; and Harris, Denis J., 4,328,685, Cl. 66-125.00R.
Harris, Paul W., to Allied Chemical Corporation. Wetting solution for use in continuous dyeing of polyamide fabric. 4,329,147, Cl. 8-636.000.

Harrison, Hartley K., executor: *See*—
Harrison, William H., deceased; and Harrison, Hartley K., executor, 4,329,023, Cl. 350-431.000.
Harrison, William H., deceased; and by Harrison, Hartley K., executor. Diffusion filter and method of making same. 4,329,023, Cl. 350-431.000.
Hart, Edwin R., to Seven-H Corporation. Method of processing grain. 4,329,371, Cl. 426-461.000.
Hart, Gene E.: *See*—
Barbee, Jack C.; and Hart, Gene E., 4,328,686, Cl. 66-224.000.
Hart, Robert E., to Square D Company. Control circuitry for multistage fans. 4,329,725, Cl. 361-18.000.
Hasegawa, Jun: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukanee; and Kobayashi, Hisao, 4,328,678, Cl. 62-126.000.
Hashimoto, Naoto: *See*—
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Hashimoto, Takashi: *See*—
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Hashizume, Hiroshi; and Izumisawa, Yoshiaki, to Mitsubishi Chemical Industries, Limited. Process for producing terephthalic acid. 4,329,493, Cl. 562-414.000.
Hasimoto, Kosuke: *See*—
Uchida, Ryohei; Yamasaki, Tatsuo; Mimura, Munehiko; Hasimoto, Kosuke; and Kawabe, Sadanobu, 4,329,636, Cl. 318-721.000.
Haskell, Raphael. Camera controller. 4,329,029, Cl. 354-23.00D.
Hatanaka, Masayuki; and Kurita, Atsushi, to Toshiba Silicone Co., Ltd. Heat-curable polysiloxane composition. 4,329,275, Cl. 524-862.000.
Hatch, Charles E., III: *See*—
Ager, John W.; Harding, Maurice J. C.; and Hatch, Charles E., III, 4,329,293, Cl. 549-470.000.
Hatebur Umformmaschinen: *See*—
Gschwend, Rene, 4,328,725, Cl. 83-27.000.
Hatfield, Jerry M. Method and apparatus for remotely controlling an electrical appliance. 4,329,678, Cl. 340-310.00A.
Hatfield, Raymond C. Portable archery muscle developer. 4,328,965, Cl. 272-137.000.
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Heath, Richard C., to Clifford Edwards Limited, a part interest. Fire extinguishers. 4,328,867, Cl. 169-58.000.
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Holzberger, Johann, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for rendering visible moved objects. 4,329,584, Cl. 250-358.00R.
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Hutchison, V. James; and Robb, Wayne F., to T-Plastech Company. Cord clamp. 4,328,605, Cl. 24-115.00G.
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Inaba, Hiroshi; Kato, Kenzi; and Nakagawa, Tamotsu, to Janome Sewing Machine Co. Ltd. Thread tension control signal output device for sewing machine. 4,328,757, Cl. 112-278.000.
Inada, Masami; Kitamura, Kazuhiko; Okumura, Shuji; Nonoyama, Takao; and Tsuji, Riichi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Multiple throttle level orifice apparatus. 4,328,832, Cl. 137-625.460.
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Parker, Ernest G., 4,329,690, Cl. 343-709.000.
Internationella Siporex Aktiebolag: *See—*
Kalvenes, ystein; Krill, Carl-Henry; Svensson, Percy; and Helmersson, Knut, 4,329,178, Cl. 106-87.000.
Interox (Societe Anonyme): *See—*
Brichard, Jean; Colery, Jean-Claude; and Sarot, Pierre, 4,329,244, Cl. 252-99.000.
Invernizzi, Rutillio; and Prella, Giovanni, to Societe d'Assistance Technique pour Produits Nestle S.A. Method for producing a sterilized processed cheese having a creamy texture. 4,329,374, Cl. 426-582.000.
Iowa State University Research Foundation, Inc.: *See—*
Herbers, Gregory J.; Hunt, Wendell C.; and Moriarity, Brian G., 4,328,845, Cl. 144-193.00A.
Irons, Brian P. G., to Lucas Industries Limited. Mounting of filament assemblies in lamp units. 4,329,007, Cl. 339-188.00R.
Ironside, John M., to Lucas Industries Limited. Closed loop control of i.c. engine idling speed. 4,328,775, Cl. 123-339.000.
Irvine, Elizabeth A.; and Twigg, Martyn V., to Imperial Chemical Industries Limited. Hydrogenation catalyst and process for the selective hydrogenation of highly unsaturated hydrocarbons. 4,329,530, Cl. 585-259.000.
Isaacson, Max. Breathing apparatus with connector system for supplying emergency air to another individual. 4,328,798, Cl. 128-202.270.
Ishige, Ryohei: *See—*
Yoshida, Yutaka; Ishige, Ryohei; Yabu, Hiroaki; and Nabeshima, Yasuo, 4,329,632, Cl. 318-587.000.
Ishihara, Shin-ichiro; Mori, Koshiro; Tanaka, Tsuneo; Nagata, Seiichi; and Fukai, Masakazu, to Matsushita Electric Industrial Co., Ltd. Semiconductor device and method of manufacturing the same. 4,329,699, Cl. 357-2.000.
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, to Canon Kabushiki Kaisha. Electrophotographic method and element. 4,329,412, Cl. 430-42.000.
Ishihara, Yasumasa: *See—*
Kikuchi, Tetsuro; Sasaya, Hideaki; and Ishihara, Yasumasa, 4,329,047, Cl. 356-28.000.
Ishii, Tadashi, to Kobishi Electric Co., Ltd. Double gong bell. 4,329,680, Cl. 340-396.000.
Ishizaka, Sunao: *See—*
Fukino, Kunihiro; and Ishizaka, Sunao, 4,329,040, Cl. 354-286.000.
Ishizuka, Yutaka; and Kobayashi, Shinichi, to Robert Bosch GmbH. Vaned rotor for rotary mechanisms with bearings in vane slots. 4,329,129, Cl. 418-138.000.
Isii, Sigeki: *See—*
Takeda, Toshio; Amano, Takehisa; Isii, Sigeki; and Hamada, Seiya, 4,328,732, Cl. 84-1.170.
Isobe, Mitsuhide, to Shimano Industrial Company Limited. Rear hub for a bicycle. 4,328,882, Cl. 192-64.000.
Isomura, Yasuo: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,329,455, Cl. 544-89.000.
Italfarmaco S.p.A.: *See—*
Sportoletti, Giancarlo, 4,329,340, Cl. 424-232.000.
Ito, Katsuo; and Murata, Bunjiro, to Murata Manufacturing Co., Ltd. Capacitor combined shield case. 4,329,733, Cl. 361-302.000.
Ito, Kunio: *See—*
Sugino, Takashi; Ito, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,329,661, Cl. 372-46.000.
Ito, Michio: *See—*
Kitamura, Takashi; and Ito, Michio, 4,329,413, Cl. 430-54.000.
Ito, Noriki: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,329,455, Cl. 544-89.000.
Ito, Ryoichi: *See—*
Doi, Atsutoshi; Aiki, Kunio; Chinone, Naoki; Nakamura, Satoshi; and Ito, Ryoichi, 4,329,658, Cl. 372-45.000.
Ito, Tadashi: *See—*
Murakami, Hiroyasu; Uchidoi, Masanori; Yamamichi, Masayoshi; Shinoda, Nobuhiko; Suzuki, Masayuki; and Ito, Tadashi, 4,329,034, Cl. 354-37.000.
Ito, Tomo: *See—*
Asakura, Masamitsu; Ito, Tomo; and Niida, Chiaki, 4,328,774, Cl. 123-327.000.
Ito, Tsuneo; and Kagawa, Junichi, to NGK Spark Plug Co., Ltd. Nickel alloy for spark plug electrodes. 4,329,174, Cl. 420-433.000.
Itoh, Hisakatsu: *See—*
Deushi, Takeo; Iwasaki, Akio; Kamiya, Kazuhiro; Mizoguchi, Toshimi; Nakayama, Masahito; Itoh, Hisakatsu; and Mori, Toshihito, 4,329,426, Cl. 435-80.000.
ITT Industries Incorporated: *See—*
Betsch, Helmut; Goertler, Horst; Liedtke, Karl-Heinz; Prohaska, Hans; and Rachner, Horst, 4,329,631, Cl. 318-466.000.
Reiner, Hans; and Auth, Werner, 4,329,640, Cl. 324-73.00R.
ITW Fastex Italia S.p.A.: *See—*
Oddenino, Maurico, 4,328,949, Cl. 251-165.000.
Ivarson, Nemo. Method and apparatus for continuously mixing a liquid and powder. 4,329,066, Cl. 366-150.000.
Iverson, Elaine J. Spill proof container and closure. 4,328,904, Cl. 220-256.000.
Iwaasa, Takashi: *See—*
Noda, Fumio; Hayashi, Kazuya; Mogi, Keitaro; Iwaasa, Takashi; Mizunuma, Takeji; and Sakasai, Toshio, 4,329,370, Cl. 426-46.000.
Iwamoto, Yoshinori: *See—*
Takashina, Naomitsu; Shimoi, Masahiro; and Iwamoto, Yoshinori, 4,329,269, Cl. 525-366.000.

Iwane, Hiroshi: *See*—
Takeda, Makoto; Uchide, Masayuki; and Iwane, Hiroshi, 4,329,507, Cl. 568-332.000.
Iwasaki, Akio: *See*—
Deushi, Takeo; Iwasaki, Akio; Kamiya, Kazuhiro; Mizoguchi, Toshimi; Nakayama, Masahito; Itoh, Hisakatsu; and Mori, Toshihito, 4,329,426, Cl. 435-80.000.
Iwasawa, Naozumi: *See*—
Suzuki, Yukio; Iwasawa, Naozumi; and Watanabe, Tadashi, 4,329,266, Cl. 524-376.000.
Iwata, Yasuhiro; Usami, Kiyoshi; Naganoma, Masanori; Nabeta, Teiichi; and Kojima, Yasuhumi, to Nippondenso Co., Ltd. Method and apparatus for controlling automobile air conditioners. 4,328,855, Cl. 165-2.000.
Izumisawa, Yoshiaki: *See*—
Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,329,493, Cl. 562-414.000.
J. A. Masterson & Co.: *See*—
Meldahl, Robert D.; and Borel, Robert J., 4,328,884, Cl. 192-105.0CF.
J. R. Schneider Co., Inc.: *See*—
Crowe, William D.; and Snell, Darrell E., 4,329,228, Cl. 210-230.000.
Jablonski, Richard J.: *See*—
Zamek, Otto S.; Pauze', Denis R.; and Jablonski, Richard J., 4,329,397, Cl. 428-379.000.
Jackovin, Gary B.: *See*—
Cowen, Theodore A.; and Jackovin, Gary B., 4,329,002, Cl. 312-196.000.
Jackson, Isaac S.; and Tilford, L. Nelson, to Mallinckrodt, Inc. Method and apparatus for inside frosting of tubing. 4,329,314, Cl. 264-519.000.
Jaeger, Klara. Disposable ash container. 4,328,895, Cl. 206-496.000.
Jahn, Dieter, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Cutter drum support arm for longwall mining machine. 4,328,996, Cl. 299-43.000.
Jambor, Arno: *See*—
Heinz, Werner; Schmidt, Adolf; and Jambor, Arno, 4,329,738, Cl. 362-61.000.
James, Kenneth A.; Quick, William H.; and Strahan, Virgil H., to Rockwell International Corporation. Method and apparatus for a Fabry-Perot multiple beam fringe sensor. 4,329,058, Cl. 356-352.000.
James, Richard L.; and Egly, Richard S., to International Minerals & Chemical Corp. Process for the nitration of methane. 4,329,523, Cl. 568-948.000.
James, William J.: *See*—
Kny, Erich; James, William J.; Levenson, Leonard L.; and Auerbach, Robert A., 4,329,418, Cl. 430-270.000.
Jameson Corporation: *See*—
Crates, Thomas B.; and Crates, James M., 4,329,078, Cl. 403-316.000.
Jander, Ulf, to Aktiebolaget Bofors. Safety and arming device for a projectile fuze. 4,328,752, Cl. 102-257.000.
Janome Sewing Machine Co. Ltd.: *See*—
Inaba, Hiroshi; Kato, Kenzi; and Nakagawa, Tamotsu, 4,328,757, Cl. 112-278.000.
Jansen, Dirk; and Keller, Friedrich, to Bodenseewerk Geratetechnik GmbH. Target seeking device. 4,329,579, Cl. 250-203.00R.
Janssen Pharmaceutica, N.V.: *See*—
Heeres, Jan; Backx, Leo; Van Laerhoven, Willy; and Sturm, Elmar, 4,329,342, Cl. 424-245.000.
Stokbroekx, Raymond A.; Willems, Joannes J. M.; and Luyckx, Marcel G. M., 4,329,353, Cl. 424-267.000.
Jardillier, Jean-Claude; Carpentier, Yves; and Desoize, Bernard, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing 2,6-bis-(diethanolamino)-4-piperidino-pyrimido[5,4-d]pyrimidine. 4,329,346, Cl. 424-251.000.
Jarrett, Graham: *See*—
Ealding, Cyril J.; and Jarrett, Graham, 4,329,423, Cl. 430-534.000.
Jasny, Jan: *See*—
Schaefer, Fritz-Peter; and Jasny, Jan, 4,329,055, Cl. 356-346.000.
Javan, Ali. Generation of stable frequency radiation at an optical frequency. 4,329,664, Cl. 332-7.510.
Jeans, Edward L., to Cadbury Schweppes Limited. Container for dispensing liquid under constant head. 4,328,909, Cl. 222-54.000.
Jensen, William E., to Hughes Aircraft Company. Charge coupled device feedback analog-to-digital converter using successive approximations. 4,329,679, Cl. 340-347.0AD.
Jirak, Thomas L.; and Beert, Frank C., to Medtronic, Inc. Output pulse artifact rejection in demand pacemakers. 4,328,807, Cl. 128-419.0PG.
Jobson, Ronald B.: *See*—
Utne, Torleif; and Jobson, Ronald B., 4,329,469, Cl. 546-203.000.
Joh, Yasushi, to Nippon Zeon Co., Ltd. Non-thrombogenic material comprising substrate which has been reacted with heparin. 4,329,383, Cl. 428-36.000.
Johannes Heidenhain GmbH: *See*—
Nelle, Gunther; and Oberhans, Johann, 4,329,736, Cl. 362-23.000.
Johansen, Aage M.; and Ronold, Olav A., deceased (by Turid, Ronold, Heir), to A/S Haustrups Fabriker. Container and method and apparatus for the coating of same. 4,329,380, Cl. 427-236.000.
Johns-Manville Corporation: *See*—
Graser, Earl J., 4,328,923, Cl. 229-33.000.
Johnson, Bruce K., to Polaroid Corporation. Multiple flash arrangement with redundant fuse arrangement. 4,329,140, Cl. 431-359.000.
Johnson, Harlan B., to PPG Industries, Inc. Process using an oxidant depolarized solid polymer electrolyte chlor-alkali cell. 4,329,209, Cl. 204-98.000.
Johnson & Johnson: *See*—
Kelly, William G. F., 4,329,309, Cl. 264-167.000.
Johnson & Johnson Products, Inc.: *See*—
Nashed, Wilson; Rovee, David T.; and Gander, Robert J., 4,329,366, Cl. 424-324.000.
Johnson, Joseph E.: *See*—
Moore, David L.; Ostop, John A.; and Johnson, Joseph E., 4,329,707, Cl. 357-73.000.
Johnson, Matthey & Co., Limited: *See*—
Hydes, Paul C., 4,329,299, Cl. 260-429.00R.
Johnson, Richard D. Device for insect control and method. 4,328,636, Cl. 43-107.000.
Johnston, Richard P.; Knapp, Malcolm H.; and Coulson, Charles E., to United States of America, National Aeronautics and Space Administration. Active clearance control system for a turbomachine. 4,329,114, Cl. 415-145.000.
Jojoba Growers & Processors Inc.: *See*—
Brown, James H.; and Olenberg, Harry, 4,329,298, Cl. 260-405.600.
Jones, Arthur H.: *See*—
Monteath, George D.; and Jones, Arthur H., 4,329,684, Cl. 340-707.000.
Jones, Brian C., to Combustion Engineering, Inc. Method of burning sulfur-containing fuels in a fluidized bed boiler. 4,329,324, Cl. 423-244.000.
Jones, Howard: *See*—
Dorn, Conrad P.; and Jones, Howard, 4,329,363, Cl. 424-320.000.
Jordan, Alex, Jr., to International Business Machines Corp. Bar code candidate select circuit. 4,329,574, Cl. 235-463.000.
Joyner, Frederick B.: *See*—
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,329,270, Cl. 524-518.000.
JSJ Corporation: *See*—
Osborn, Charles, 4,328,712, Cl. 74-476.000.
Juengel, Richard O.; Begin, John D.; and Khalaf, John, to Valeron Corporation, The. Telemetry gage system. 4,328,623, Cl. 33-174.00L.
Jundt, Werner; and Roozenbeek, Herman, to Robert Bosch GmbH. Ignition system for internal combustion engines. 4,328,782, Cl. 123-609.000.
Junk, Dieter: *See*—
Pav, Josef; and Junk, Dieter, 4,328,744, Cl. 100-162.00B.
Jurkov, Leonid I.: *See*—
Druzhinin, Ernest A.; Kubasov, Vladimir L.; Busse-Machukas, Vladimir B.; Lvovich, Florenty I.; Krongauz, Evgeny L.; and Jurkov, Leonid I., 4,329,219, Cl. 204-290.00F.
Kabushiki Kaisha Airin: *See*—
Yoshikazu, Hayashi, 4,328,741, Cl. 99-332.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Tanaka, Kojiro, 4,329,700, Cl. 357-22.000.
Kabushiki Kaisha Hoya Lens (Hoya Lens Corporation): *See*—
Tarumi, Niro; Tsuchiya, Makoto; and Sasaki, Kunio, 4,329,378, Cl. 427-157.000.
Kabushiki Kaisha Sunpak: *See*—
Kamon, Akio; Nagashima, Sakyo; and Tsuruta, Yuzo, 4,329,624, Cl. 315-151.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Fujiwara, Hitoshi; and Kawabata, Yousei, 4,328,747, Cl. 101-93.170.
Gotho, Mitsuhiro; Ikeda, Masayuki; Komatsu, Hidetoshi; and Naka, Takahiro, 4,328,731, Cl. 84-1.010.
Ikeda, Masayuki; and Aoki, Kenji, 4,329,641, Cl. 324-115.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukanee; and Kobayashi, Hisao, 4,328,678, Cl. 62-126.000.
Kabushiki Kaisha Yamashina Seikosho: *See*—
Shimizu, Mituo; and Miyake, Hidenori, 4,329,099, Cl. 411-412.000.
Kacmarcik, Donald J., to International Business Machines Corporation. Ribbon feed and lift mechanism for a typewriter. 4,329,072, Cl. 400-208.000.
Kaganowicz, Grzegorz, to RCA Corporation. Method for preparing an abrasive coating. 4,328,646, Cl. 51-281.00R.
Kagawa, Junichi: *See*—
Ito, Tsuneo; and Kagawa, Junichi, 4,329,174, Cl. 420-433.000.
Kahle, W. Wayne: *See*—
Scott, Roger P.; and Kahle, W. Wayne, 4,328,644, Cl. 49-501.000.
Kaiser Aluminum & Chemical Corporation: *See*—
LaLama, Samuel J.; and Fennema, Paul T., 4,328,956, Cl. 266-275.000.
Kajtar, Marton: *See*—
Rochricht, Julianna; Kisfaludy, Lajos; Kajtar, Marton; Palosi, Eva; and Szporny, Laszlo, 4,329,341, Cl. 424-244.000.
Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,329,350, Cl. 424-258.000.
Kalendovsky, Jiri. Composite reel and stand for a swimming pool cover. 4,328,930, Cl. 242-55.000.
Kallick, Charles A. Diagnostic method for detection of systemic lupus erythematosus. 4,329,331, Cl. 424-8.000.
Kallmann, Jurgen, to Palitex Project-Company GmbH. Two-for-one spinning or twisting spindle having a compressed-air-operated threading arrangement. 4,328,663, Cl. 57-279.000.
Kalpins, Alexandrs K. Support system. 4,328,648, Cl. 52-167.000.
Kalvenes, ystein; Krill, Carl-Henry; Svensson, Percy; and Helmersson, Knut, to Internationella Siporex Aktiebolag. Method in the manufacture of steam-cured light-weight aerated concrete with hydrophobic properties. 4,329,178, Cl. 106-87.000.

Kamiya, Kazuhiro: *See*—
Deushi, Takeo; Iwasaki, Akio; Kamiya, Kazuhiro; Mizoguchi, Toshimi; Nakayama, Masahito; Itoh, Hisakatsu; and Mori, Toshihito, 4,329,426, Cl. 435-80.000.
Kamiya, Shingo, to Nippon Gakki Seizo Kabushiki Kaisha. Amplifier with power supply switching. 4,329,657, Cl. 330-297.000.
Kamon, Akio; Nagashima, Sakyo; and Tsuruta, Yuzo, to Kabushiki Kaisha Sunpak. Computer type electronic photoflash. 4,329,624, Cl. 315-151.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Asada, Kosaku; and Maeno, Hiroo, 4,328,838, Cl. 138-118.100.
Shiozaki, Ken; and Ibaraki, Hironobu, 4,329,323, Cl. 423-240.000.
Kaneko, Hirokazu, to Ricoh Company, Ltd. Shutter release apparatus. 4,329,039, Cl. 354-266.000.
Kaneko, Nobutaka: *See*—
Fujiwara, Toshihide; and Kaneko, Nobutaka, 4,329,591, Cl. 250-548.000.
Kaneko, Toshiaki: *See*—
Aoshima, Atsushi; Mitsui, Ryoichi; and Kaneko, Toshiaki, 4,329,513, Cl. 568-492.000.
Kanetsu Kogyo Kabushiki Kaisha: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,329,673, Cl. 335-288.000.
Kaniss, Normann; and Bauer, Adolf, to Diamalt Aktiengesellschaft. Method for the production of 4-hydroxyphenylacetic acid. 4,329,497, Cl. 562-478.000.
Kansai Paint Co., Ltd.: *See*—
Suzuki, Yukio; Iwasawa, Naozumi; and Watanabe, Tadashi, 4,329,266, Cl. 524-376.000.
Kapany, Narinder S.; and Unterleitner, Fred C., to Kaptron, Inc. Fiber optics communications modules. 4,329,017, Cl. 350-96.150.
Kaptron, Inc.: *See*—
Kapany, Narinder S.; and Unterleitner, Fred C., 4,329,017, Cl. 350-96.150.
Karlsson, Rune. Plough for working of soil. 4,328,870, Cl. 172-657.000.
Karpati, Egon: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,329,350, Cl. 424-258.000.
Kasamura, Toshirou: *See*—
Kitajima, Tadayuki; Kasamura, Toshirou; Aoki, Tomohiro; Takeoka, Yoshihiko; and Namekata, Kiyokazu, 4,329,044, Cl. 355-15.000.
Kasztreiner, Endre: *See*—
Szilagyi, Geza; Matyus, Peter; Kasztreiner, Endre; Balogh, Tibor; and Ila, Lajos, 4,329,457, Cl. 544-114.000.
Kato, Kenzi: *See*—
Inaba, Hiroshi; Kato, Kenzi; and Nakagawa, Tamotsu, 4,328,757, Cl. 112-278.000.
Katsaros, Arthur T.: *See*—
Sherman, John D.; and Katsaros, Arthur T., 4,329,160, Cl. 55-62.000.
Katsch, Peter: *See*—
Kinzel, Hermann; and Katsch, Peter, 4,329,613, Cl. 310-344.000.
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., to Union Carbide Corporation. Process and catalyst for olefin hydration. 4,329,520, Cl. 568-896.000.
Kavli, Fred; Park, Kyong; and Affel, John J., to Kavlico Corporation. Precision capacitance transducer. 4,329,732, Cl. 361-283.000.
Kavlico Corporation: *See*—
Kavli, Fred; Park, Kyong; and Affel, John J., 4,329,732, Cl. 361-283.000.
Kawabata, Yasuhiro; and Shibata, Noriyoshi, to Aisin Seiki Kabushiki Kaisha. Diaphragm air pump assembly. 4,329,123, Cl. 417-393.000.
Kawabata, Yousei: *See*—
Fujiwara, Hitoshi; and Kawabata, Yousei, 4,328,747, Cl. 101-93.170.
Kawabe, Sadanobu: *See*—
Uchida, Ryohei; Yamasaki, Tatsuo; Mimura, Munehiko; Hasimoto, Kosuke; and Kawabe, Sadanobu, 4,329,636, Cl. 318-721.000.
Kawai, Hisasi; Morino, Seiji; Fukami, Akira; and Hamaguchi, Hiroshi, to Nippon Soken, Inc. Starting assist system for diesel engines. 4,328,771, Cl. 123-179.0BG.
Kawai, Senji; Morimoto, Yoshihumi; Watanabe, Masayuki; Yamaya, Hiroshi; Kurohata, Hitoshi; and Nakamura, Joji, to Matsushita Electric Industrial Company, Limited. Noise suppressing connector. 4,329,665, Cl. 333-182.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujikawa, Tetsuzo; Takada, Toshiyuki; and Tamba, Shinichi, 4,328,769, Cl. 123-41.470.
Kawazoe, Michio. Rotary hot shoe mechanism. 4,329,735, Cl. 362-18.000.
Kaye Instruments, Inc.: *See*—
Goldschmidt, Robert E.; Ku, Charles C.; and Townzen, David A., 4,329,693, Cl. 346-33.0TP.
Kazienko, Henry J.: *See*—
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,329,193, Cl. 156-162.000.
Keeton Sons & Co. Ltd.: *See*—
Beaumont, Graham J., 4,328,695, Cl. 72-389.000.
Keller, Friedrich: *See*—
Jansen, Dirk; and Keller, Friedrich, 4,329,579, Cl. 250-203.00R.
Keller, Hans; and Legault, Claude. Spring bolt combination lock. 4,328,689, Cl. 70-303.00A.
Kelley Company Inc.: *See*—
Bennett, David E., 4,328,602, Cl. 14-71.300.
Kelly, William G. F., to Johnson & Johnson. Producing reticulated thermoplastic rubber products. 4,329,309, Cl. 264-167.000.
Kemr, Miro; and Mizuhara, Howard, to GTE Products Corporation. Flexible ceramic tape and method of making same. 4,329,271, Cl. 524-386.000.
Kendall Company, The: *See*—
Arkans, Edward J., 4,328,814, Cl. 128-640.000.
Cianci, James P., 4,328,828, Cl. 137-549.000.
Kenneth E. Beswick Limited: *See*—
Gale, James A. S., 4,329,006, Cl. 339-126.00R.
Kermer, Wolf-Dieter: *See*—
Hansen, Guenter; Kermer, Wolf-Dieter; and Stuck, Jochen-Wilfried, 4,329,148, Cl. 8-639.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Sittardt, Hans-Gunter; and Radke, Matthias, 4,329,319, Cl. 422-224.000.
Keske, Frank E., to Caterpillar Tractor Co. Self-contained, damped ball bearing assembly. 4,329,000, Cl. 308-187.000.
Khalaf, John: *See*—
Juengel, Richard O.; Begin, John D.; and Khalaf, John, 4,328,623, Cl. 33-174.00L.
Khanna, Pyare L.; and Ullman, Edwin F., to Syva Company. Fluorescent thyroid hormone conjugates and their uses. 4,329,461, Cl. 544-375.000.
Kidron, Aryeh: *See*—
Conrad, Raymond W.; and Kidron, Aryeh, 4,329,583, Cl. 250-330.000.
Kiernan, James G.; and Leonard, James G., to General Electric Company. Flow divider with plural metering gears, unrestrained spacers there-between and lubricated end roller bearings. 4,328,824, Cl. 137-99.000.
Kierstead, Richard W.: *See*—
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,329,289, Cl. 549-449.000.
Kikkoman Shoyu Co. Ltd.: *See*—
Noda, Fumio; Hayashi, Kazuya; Mogi, Keitaro; Iwaasa, Takashi; Mizunuma, Takeji; and Sakasai, Toshio, 4,329,370, Cl. 426-46.000.
Kikuchi, Tetsuro; Sasaya, Hideaki; and Ishihara, Yasumasa, to Nippon Soken, Inc. Optical velocity measuring apparatus of non-contact measurement type. 4,329,047, Cl. 356-28.000.
Kilham, Peter. Bird feeder perch. 4,328,765, Cl. 119-51.00R.
Kilian, Eberhard; and Schneider, Georg, to Degussa Aktiengesellschaft. Process for the granulation of glass melts. 4,329,164, Cl. 65-21.200.
Kim, Bang M., to General Electric Company. Wastewater treatment process. 4,329,224, Cl. 210-709.000.
Kimberlin, Dan W., to General Electric Co. Brush wear indicator for a dynamoelectric machine. 4,329,683, Cl. 340-679.000.
Kimbrell, William C., Jr., to Milliken Research Corporation. Polyester textile materials having improved durable soil release characteristics and process for producing same. 4,329,389, Cl. 428-263.000.
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel fluorinated cation exchange membrane and process for producing the same. 4,329,434, Cl. 521-27.000.
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel fluorinated copolymer with tridihydro fluorosulfonyl fluoride pendant groups and preparation thereof. 4,329,435, Cl. 521-38.000.
Kimura, Kenji, to Olympus Optical Company Limited. Video tape recording and reproducing apparatus with line base correction. 4,329,718, Cl. 360-9.000.
Kimura, Masamichi, to Matsushita Electronics Corporation. Direct-view storage tube with multiple path target electrode. 4,329,619, Cl. 313-470.000.
King, William K., Sr. Universal woodworking machine. 4,328,847, Cl. 144-326.00R.
Kinoshita, Takao: *See*—
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,329,033, Cl. 354-25.000.
Kinzel, Hermann; and Katsch, Peter, to Siemens Aktiengesellschaft. Resonator component module. 4,329,613, Cl. 310-344.000.
Kioritz Corporation: *See*—
Satoh, Masatoshi, 4,328,617, Cl. 30-382.000.
Kirchner, Darrell G.: *See*—
Chakrabarti, Paritosh M.; and Kirchner, Darrell G., 4,329,268, Cl. 524-166.000.
Kircus, John D. Insulated inflatable solar collector with strengthening matrix configuration. 4,328,790, Cl. 126-426.000.
Kirkpatrick, Robert J., to Bell Telephone Laboratories, Incorporated. Connector lead insertion method. 4,328,613, Cl. 29-837.000.
Kisfaludy, Lajos: *See*—
Rochricht, Julianna; Kisfaludy, Lajos; Kajtar, Marton; Palosi, Eva; and Szporny, Laszlo, 4,329,341, Cl. 424-244.000.
Kishi, Tomomi; and Yamamoto, Yoshitaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Resistance welder. 4,329,559, Cl. 219-89.000.
Kishiyama, Lawrence K. Fireplace heat sink. 4,328,785, Cl. 126-165.000.
Kitagawa, Junji: *See*—
Akita, Sigeyuki; and Kitagawa, Junji, 4,328,706, Cl. 73-493.000.
Kitahara, Nobuko: *See*—
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,329,412, Cl. 430-42.000.

Kitajima, Nobuo: *See*—
Ishihara, Shunichi; Kitajima, Nobuo; Nishigaki, Yuji; and Kitahara, Nobuko, 4,329,412, Cl. 430-42.000.

Kitajima, Tadayuki; Kasamura, Toshirou; Aoki, Tomohiro; Takeoka, Yoshihiko; and Namekata, Kiyokazu, to Canon Kabushiki Kaisha. Cleaning apparatus. 4,329,044, Cl. 355-15.000.

Kitamura, Kazuhiko: *See*—
Inada, Masami; Kitamura, Kazuhiko; Okumura, Shuji; Nonoyama, Takao; and Tsuji, Riichi, 4,328,832, Cl. 137-625.460.

Kitamura, Takashi; and Ito, Michio, to Canon Kabushiki Kaisha. Electrophotographic process capable of forming overlaid images and apparatus for carrying out the same. 4,329,413, Cl. 430-54.000.

Kitoh, Tokio: *See*—
Shono, Kanji; Kitoh, Tokio; Sano, Hiroshi; and Hironaka, Takashi, 4,329,154, Cl. 23-301.000.

Kiyohara, Takehiko: *See*—
Minoura, Kazuo; Kiyohara, Takehiko; and Uchiyama, Haruo, 4,329,012, Cl. 350-6.800.

Kizai Kabushiki Kaisha: *See*—
Maruta, Masatosi, 4,329,207, Cl. 204-54.00L.

Klass, Donald L.: *See*—
Ghosh, Sambhunath; and Klass, Donald L., 4,329,428, Cl. 435-167.000.

Klauke, Erich; Kysela, Ernst; Stuwe, Arnd; and Dorlars, Alfons, to Bayer Aktiengesellschaft. Process for the preparation of 2,4,6-trifluoro-1,3,5-triazine. 4,329,458, Cl. 544-217.000.

Klavestad, Osborne, to Olde Savannah Arms Company. Firearm having multiple barrels movable together to one side. 4,328,635, Cl. 42-12.000.

Klawitter, Jerome J., to Hemex, Inc. Heart valve prosthesis. 4,328,592, Cl. 3-1.500.

Kleebaur, Karl: *See*—
Hagenlocher, Walter; Hesse, Heinz; Sohnle, Rudiger; Kleebaur, Karl; and Kugel, Christoph, 4,329,608, Cl. 310-91.000.

Kleese, Edward J.: *See*—
Arnason, Sigurdur I.; and Kleese, Edward J., 4,329,134, Cl. 425-157.000.

Klein, Gerold K. V.; and Houck, John C. Enzyme mixture. 4,329,430, Cl. 435-219.000.

Klein, Henry, to Black & Decker Inc. Armature winding pattern for an electric motor. 4,329,610, Cl. 310-220.000.

Klein, Joseph T.: *See*—
Effland, Richard C.; Davis, Larry; and Klein, Joseph T., 4,329,464, Cl. 546-17.000.

Kleinewefers GmbH: *See*—
Pav, Josef; and Junk, Dieter, 4,328,744, Cl. 100-162.00B.

Klemarczyk, Philip T.; Schmitt, Frederick L.; Granda, Edward J.; and Luccarelli, Domenick, Jr., to International Flavors & Fragrances Inc. Use of carboamidoalkyl norbornanes for augmenting or enhancing the aroma or taste of a foodstuff. 4,329,373, Cl. 426-538.000.

Kliklok Corporation: *See*—
Hirata, Seiichiro, 4,328,922, Cl. 229-27.000.

Klockner-Humboldt-Deutz AG: *See*—
Herchenbach, Horst; and Ansen, Jakob, 4,329,180, Cl. 106-100.000.

Kloevekorn, Volker; and Raudonat, Ullrich, to International Standard Electric Corporation. Radar radiating polarized signals. 4,329,687, Cl. 343-13.00R.

Klose, Sigmar: *See*—
Haar, Hans-Peter; Edelmann, Hermann; and Klose, Sigmar, 4,329,062, Cl. 356-414.000.

Knapp, Malcolm H.: *See*—
Johnston, Richard P.; Knapp, Malcolm H.; and Coulson, Charles E., 4,329,114, Cl. 415-145.000.

Knapp, Todd K.: *See*—
Huber, William J.; and Knapp, Todd K., 4,329,554, Cl. 200-151.000.

Knickerbocker, Michael G., to Seaquist Valve Company. Child resistant aerosol actuating overcap. 4,328,911, Cl. 222-182.000.

Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. *Mycobacterium fortuitum* strain. 4,329,432, Cl. 435-253.000.

Knight, Peter R., to RCA Corporation. Side pincushion modulator circuit with overstress protection. 4,329,729, Cl. 361-91.000.

Knoffsinger, Fred E.: *See*—
White, Eugene W.; Gross, Francis M.; and Knoffsinger, Fred E., 4,329,202, Cl. 201-27.000.

Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,328,714, Cl. 74-501.00R.

Knoll International, Inc.: *See*—
Eldon, James B., III, 4,328,943, Cl. 248-578.000.

Knollmueller, Karl O., to Olin Corporation. Process for preparing alkoxysilane cluster compounds by reacting a trialkoxysilanol with a triamidosilane. 4,329,485, Cl. 556-458.000.

Knollmueller, Karl O., to Olin Corporation. Process for preparing alkoxysilane cluster compounds by reacting a trialkoxysilanol with an amidated alkoxysilane cluster compound. 4,329,486, Cl. 556-458.000.

Kny, Erich; James, William J.; Levenson, Leonard L.; and Auerbach, Robert A., to Lord Corporation. Organometallic semiconductor devices. 4,329,418, Cl. 430-270.000.

Kobayashi, Hisao: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukanee; and Kobayashi, Hisao, 4,328,678, Cl. 62-126.000.

Kobayashi, Shinichi: *See*—
Ishizuka, Yutaka; and Kobayashi, Shinichi, 4,329,129, Cl. 418-138.000.

Kobayashi, Takehiro: *See*—
Holahan, Joseph M.; Kobayashi, Takehiro; and Sazaki, Konin, 4,328,937, Cl. 242-218.000.

Kobe Steel Limited: *See*—
Nishimura, Yoshiyuki, 4,329,126, Cl. 418-1.000.

Kobishi Electric Co., Ltd.: *See*—
Ishii, Tadashi, 4,329,680, Cl. 340-396.000.

Kobori, Toshio: *See*—
Sahara, Masayoshi; Kobori, Toshio; and Yamada, Seiji, 4,329,035, Cl. 354-37.000.

Koch, Julius: *See*—
Seebeck, Dietrich; Schildmann, Jens A.; Weisrock, Reinhard; and Koch, Julius, 4,329,433, Cl. 435-255.000.

Koch, Klaus: *See*—
Vogelsberg, Dieter; and Koch, Klaus, 4,328,664, Cl. 57-293.000.

Kodama, Hisao, to Tokyo Shibaura Denki Kabushiki Kaisha. Cassette tape recorder with stop mechanism which detects the stop of a tape run. 4,329,720, Cl. 360-74.300.

Kohler, William J.: *See*—
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., 4,329,388, Cl. 428-216.000.

Kojima, Yasuhumi: *See*—
Iwata, Yasuhiro; Usami, Kiyoshi; Naganoma, Masanori; Nabeta, Teiichi; and Kojima, Yasuhumi, 4,328,855, Cl. 165-2.000.

Kokubo, Toshiyuki; and Yamao, Takashi, to Sumitomo Chemical Company, Limited. Process for producing highly crystalline α-olefinic polymer. 4,329,440, Cl. 526-142.000.

Koll, Jochen; Molls, Hans-Heinz; Hornle, Reinhold; Schuffenhauer, Erhard; Brandt, Horst; Bremer, Fritz; Wolf, Karlheinz; and Schiwy, Willy, to Bayer Aktiengesellschaft. Process for producing liquid dyestuff preparations. 4,329,145, Cl. 8-527.000.

Koll, Laurel A., to LeadRite Corporation. Lead calculator. 4,329,570, Cl. 235-78.00R.

Koller, Stefan: *See*—
Eugster, Peter; and Koller, Stefan, 4,329,144, Cl. 8-526.000.

Kollmorgen Technologies Corp.: *See*—
Hazelton, Robert C.; and Hoyt, J. Ray, 4,329,564, Cl. 219-121.0LJ.

Kolor, Michael G., to General Foods Corporation. Ethyl 3-mercaptopropionate as a grape flavor. 4,329,372, Cl. 426-535.000.

Koltse, John G. Apparatus and method for dispensing purifying media mixture. 4,329,235, Cl. 210-777.000.

Komatsu, Hidetoshi: *See*—
Gotho, Mitsuhiro; Ikeda, Masayuki; Komatsu, Hidetoshi; and Naka, Takahiro, 4,328,731, Cl. 84-1.010.

Komura, Hirotsugu; Ueguri, Shigeo; and Tabata, Youichiro, to Mitsubishi Denki Kabushiki Kaisha. Glow discharge heating apparatus. 4,329,563, Cl. 219-121.00P.

Konishiroku Photo Industry Co., Ltd.: *See*—
Nagatani, Toshio; Habu, Takeshi; and Takahashi, Kazuo, 4,329,417, Cl. 430-264.000.

Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukanee; and Kobayashi, Hisao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Refrigerant compressor protecting device. 4,328,678, Cl. 62-126.000.

Koolatron Industries, Ltd.: *See*—
Reed, Michael A., 4,328,676, Cl. 62-3.000.

Koomey, Inc.: *See*—
Baugh, Hollis A., 4,328,826, Cl. 137-236.00S.

Kopke, Michael: *See*—
Schummer, Anton; Hansen, Uwe-Jens; and Kopke, Michael, 4,329,170, Cl. 75-23.000.

Kotake, Tosio; Watanabe, Katuaki; and Koyanagi, Kaoru, to Tokyo Denryoku Kabushiki Kaisha; and Tokyo Shibaura Denki Kabushiki Kaisha. Control apparatus for a synchronous machine. 4,329,637, Cl. 322-20.000.

Kotecha, Harish N.; and DeLaMoneda, Francisco H., to International Business Machines Corporation. Simultaneously forming fully implanted DMOS together with enhancement and depletion mode MOSFET devices. 4,329,186, Cl. 148-1.500.

Kowa Company, Ltd.: *See*—
Deushi, Takeo; Iwasaki, Akio; Kamiya, Kazuhiro; Mizoguchi, Toshimi; Nakayama, Masahito; Itoh, Hisakatsu; and Mori, Toshihito, 4,329,426, Cl. 435-80.000.

Koyanagi, Kaoru: *See*—
Kotake, Tosio; Watanabe, Katuaki; and Koyanagi, Kaoru, 4,329,637, Cl. 322-20.000.

Krapf, Heinz; Oppenlaender, Knut; and Uhl, Guenter, to BASF Aktiengesellschaft. 1,3-Bis-aryl-glycerol-ethers. 4,329,176, Cl. 106-19.000.

Krasser, Fritz; and Onderka, Oswald, to Ellenberger & Poensgen GmbH. Circuit breaker with auxiliary tripping unit. 4,329,669, Cl. 335-20.000.

Kraushaar, Robert J.; and Ward, Kevin B., to International Standard Electric Corporation. Liquid band pass filters. 4,329,261, Cl. 252-582.000.

Kress, Robert W., to Grumman Aerospace Corporation. Directionally stabilized wind turbine. 4,329,115, Cl. 416-11.000.

Krieg, Walter J.: *See*—
Chiu, Chung-Wai; and Krieg, Walter J., 4,329,181, Cl. 106-213.000.

Krill, Carl-Henry: *See*—
Kalvenes, ystein; Krill, Carl-Henry; Svensson, Percy; and Helmersson, Knut, 4,329,178, Cl. 106-87.000.

Kristensen, Leif; Lundborg, Hans; and Nyqvist, Stig, to Nitro Nobel AB. Low-energy fuse consisting of a plastic tube the inner surface of which is coated with explosive in powder form. 4,328,753, Cl. 102-275.500.

Krongauz, Evgeny L.: *See*—
Druzhinin, Ernest A.; Kubasov, Vladimir L.; Busse-Machukas, Vladimir B.; Lvovich, Florenty I.; Krongauz, Evgeny L.; and Jurkov, Leonid I., 4,329,219, Cl. 204-290.00F.

Kropp, James E., to Minnesota Mining and Manufacturing Company. Corrosion-resistant reflective or transparent-reflective sheet material. 4,329,396, Cl. 428-354.000.

Krulls, Gerd E.: *See—*
Ohmstedt, Harry O.; Ruth, William H.; and Krulls, Gerd E., 4,329,611, Cl. 310-227.000.

Krupa, Andrew S.: *See—*
Velenyi, Louis J.; and Krupa, Andrew S., 4,329,506, Cl. 568-310.000.

Krusche, Kurt. Crockery and glassware stand. 4,328,899, Cl. 211-41.000.

Ku, Charles C.: *See—*
Goldschmidt, Robert E.; Ku, Charles C.; and Townzen, David A., 4,329,693, Cl. 346-33.0TP.

Kubasov, Vladimir L.: *See—*
Druzhinin, Ernest A.; Kubasov, Vladimir L.; Busse-Machukas, Vladimir B.; Lvovich, Florenty I.; Krongauz, Evgeny L.; and Jurkov, Leonid I., 4,329,219, Cl. 204-290.00F.

Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, to Yamanouchi Pharmaceutical Co., Ltd. 1,3-Oxazino(3,2-b)isoquinoline-6-ones. 4,329,455, Cl. 544-89.000.

Kucharzyk, Werner: *See—*
Habermehl, Diethard; and Kucharzyk, Werner, 4,329,141, Cl. 432-17.000.

Kudo, Bosshi, to Mitsubishi Kinzoku Kabushiki Kaisha; and Toyo Silicon Co., Ltd. Lateral pulling growth of crystal ribbons. 4,329,195, Cl. 156-617.0SP.

Kuehnle, Manfred R., to Coulter Systems Corporation. Multiple copy electrophotographic reproducing apparatus. 4,329,043, Cl. 355-14.00R.

Kugel, Christoph: *See—*
Hagenlocher, Walter; Hesse, Heinz; Sohnle, Rudiger; Kleebaur, Karl; and Kugel, Christoph, 4,329,608, Cl. 310-91.000.

Kuhlein, Klaus: *See—*
Bauer, Wolfgang; and Kuhlein, Klaus, 4,329,503, Cl. 564-418.000.

Kuhn, Eberhard: *See—*
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, 4,329,556, Cl. 548-549.000.

Kuhn, Wenzel; Riedl, Josef; and Widmann, Peter, to Hoechst Aktiengesellschaft. Process for the manufacture of 1,2-dichloroethane. 4,329,527, Cl. 570-245.000.

Kulprathipanja, Santi: *See—*
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,329,280, Cl. 260-97.600.

Kuno, Akira; Matsui, Takeshi; and Shinoda, Yoshio, to Nippon Soken, Inc. Speed control system for automotive vehicles. 4,328,776, Cl. 123-352.000.

Kunz, Raymond W.; and Fleischhauer, Eugene T., to Clairol Incorporated. Electrically heated rotatable curler brush. 4,329,567, Cl. 219-222.000.

Kunz, Richard H.: *See—*
Gumberich, Clinton L.; Visioli, Armando J., Jr.; and Kunz, Richard H., 4,328,874, Cl. 177-25.000.

Kuo, Han C.: *See—*
Bowden, William L.; Foster, Donald L.; Kuo, Han C.; and Moses, Peter R., 4,329,404, Cl. 429-50.000.

Kurihara, Mamoru: *See—*
Akiyama, Seiji; Kurihara, Mamoru; and Ueki, Kazuhiko, 4,329,104, Cl. 414-139.000.

Kurita, Atsushi: *See—*
Hatanaka, Masayuki; and Kurita, Atsushi, 4,329,275, Cl. 524-862.000.

Kurita, Toshiyuki: *See—*
Masuda, Michio; Nabeyama, Hiroaki; and Kurita, Toshiyuki, 4,329,709, Cl. 358-44.000.

Kurohata, Hitoshi: *See—*
Kawai, Senji; Morimoto, Yoshihumi; Watanabe, Masayuki; Yamaya, Hiroshi; Kurohata, Hitoshi; and Nakamura, Joji, 4,329,665, Cl. 333-182.000.

Kurono, Hitoshi: *See—*
Yabutani, Kunihiro; Matsui, Hisanori; Tanaka, Hiroshi; and Kurono, Hitoshi, 4,329,479, Cl. 549-39.000.

Kutta, Helmuth W., to Atlantic Richfield Company. Method for encapsulating arsenic-contaminated wastes. 4,329,179, Cl. 106-97.000.

Kuwakado, Satosi: *See—*
Tsuge, Noboru; Kuwakado, Satosi; and Shimogawa, Toshiaki, 4,328,976, Cl. 280-806.000.

Kwong, Gary W. Y.; and Levy, Joseph, to UOP Inc. Preparation of polymeric reaction products of alkoxyalkylamines and epihalohydrins. 4,329,505, Cl. 564-476.000.

Kyburz, Emilio: *See—*
Imhof, Rene; and Kyburz, Emilio, 4,329,467, Cl. 546-138.000.

Kysela, Ernst: *See—*
Klauke, Erich; Kysela, Ernst; Stuwe, Arnd; and Dorlars, Alfons, 4,329,458, Cl. 544-217.000.

LaBate, Michael D. Prefabricated multiple density blast furnace runner. 4,328,957, Cl. 266-196.000.

Lacombat, Michel; and Lefevre, Herve, to Thomson-CSF. Optical fiber interferometric rate gyro particularly adapted to the measurement of low rotational speeds. 4,329,056, Cl. 356-350.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,328,880, Cl. 182-93.000.

LaLama, Samuel J.; and Fennema, Paul T., to Kaiser Aluminum & Chemical Corporation. Taphole assembly and method of installation. 4,328,956, Cl. 266-275.000.

Lam, Do M.: *See—*
Mau-Tung, Do; and Lam, Do M., 4,328,701, Cl. 73-59.000.

Lam, Julia H.: *See—*
Crivello, James V.; and Lam, Julia H., 4,329,300, Cl. 260-440.000.

Lamotte, Claude: *See—*
Rousseau, Gerard; and Lamotte, Claude, 4,329,183, Cl. 127-46.200.

Lanciano, Ralph L., to Raytheon Company. Cathode ray tube with light transparent panel and adhesive therefor. 4,329,620, Cl. 313-478.000.

Land, Edwin H., to Polaroid Corporation. Multicolor diffusion transfer products. 4,329,411, Cl. 430-30.000.

Landa, Benzion, to Savin Corporation. Method of avoiding collisions of projectiles in a microballistic printer. 4,329,070, Cl. 400-118.000.

Landis, Bruce J.: *See—*
Goudy, Paul R., Jr., 4,329,067, Cl. 366-182.000.

Landis, Kenneth J.: *See—*
Goudy, Paul R., Jr., 4,329,067, Cl. 366-182.000.

Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Hydrated $Mg(NO_3)_2/MgCl_2$ reversible phase change compositions. 4,329,242, Cl. 252-70.000.

Lang, Frank B., to RCA Corporation. Adaptive distortion elimination circuitry for a video disc player. 4,329,712, Cl. 358-128.500.

Lang, Stanley A., Jr.; Lin, Yang-i; and Ridge, David N., to American Cyanamid Company. Substituted 1H-1,2,4-triazoles. 4,329,463, Cl. 544-405.000.

Langer, Herbert; and Saiveau, Gerald, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Method of making an abradable stator joint for an axial turbomachine. 4,329,308, Cl. 264-162.000.

Langlais, Eugene L., to Napp Systems (USA), Inc. Post-exposure treating solution for photosensitive graphic arts articles. 4,329,422, Cl. 430-331.000.

Langner, Gunter P.: *See—*
Schubart, Rudiger; and Langner, Gunter P., 4,329,477, Cl. 548-305.000.

LaPerre, James D.; and O'Brien, Donald L., to Minnesota Mining and Manufacturing Company. Coating compositions for retrospective identification of articles. 4,329,393, Cl. 428-325.000.

Lapeyre, James M., to Laitram Corporation, The. Circular ladder. 4,328,880, Cl. 182-93.000.

Lapides Corporation: *See—*
Coreth, Alois, 4,329,076, Cl. 403-109.000.

Larson, Paul: *See—*
Schoonover, David J.; and Larson, Paul, 4,329,149, Cl. 23-230.00R.

Latos, Edward L., to General Electric Company. Flash lamp array having electrical shield. 4,329,734, Cl. 362-13.000.

Laupper, Anton. Hydraulic lifting device. 4,328,951, Cl. 254-89.00H.

Lauwerys, Robert R.; and Bernard, Alfred M., to International Lead Zinc Research Organization, Inc. Determination of β_2-microglobulin in human urine and serum by latex immunoassay. 4,329,152, Cl. 23-230.00B.

Lawrence, Brian R.; and Downing, Peter M., to Xerox Corporation. Stitchers. 4,328,919, Cl. 227-155.000.

Lawrence, Paul J.: *See—*
Detweiler, Michael B.; Lawrence, Paul J.; and Townsley, Charles W., 4,329,317, Cl. 422-58.000.

LeadRite Corporation: *See—*
Koll, Laurel A., 4,329,570, Cl. 235-78.00R.

Lechner, Hans-Peter, to Mettler Instrumente AG. Scale with digital display of available weight range. 4,328,875, Cl. 177-165.000.

Leclercq, Pierre: *See—*
Bernard, Georges; and Leclercq, Pierre, 4,329,551, Cl. 200-147.00R.

Lee Norse Company: *See—*
Hakes, Gary A.; and McCracken, William E., 4,328,994, Cl. 299-11.000.

Lee, Patrick S.; and Cuda, John, to Sperry Corporation. Tachometer for deriving average velocity output by sampling position signal. 4,329,721, Cl. 360-78.000.

Lefevre, Herve: *See—*
Lacombat, Michel; and Lefevre, Herve, 4,329,056, Cl. 356-350.000.

Lefevre, William; and Darlington, Robert P. Length and angle gauge. 4,328,619, Cl. 33-161.000.

Legault, Claude: *See—*
Keller, Hans; and Legault, Claude, 4,328,689, Cl. 70-303.00A.

Le Grouyellec, Andre; and Ponsy, Jacques. Capsules for determining the alcohol content of the breath. 4,329,318, Cl. 422-59.000.

Leichnitz, Kurt, to Dragerwerk Aktiengesellschaft. Test tube construction and method for testing for copper aerosols. 4,329,153, Cl. 23-232.00R.

Leistra, Philip W., Jr.; and Barnes, Robert M., to General Motors Corporation. Trim bezel installation tool. 4,328,612, Cl. 29-802.000.

Leitner, Franz, to H. Walli Gesellschaft m.b.H. Papier- und Zellstoffwattefabrik. Apparatus for drying a fibrous web. 4,328,626, Cl. 34-115.000.

Le Maguet, Daniel, to Enertec. Capacitive voltage transformers. 4,329,638, Cl. 323-233.000.

Lenke, Dieter: *See—*
Frickel, Fritz-Frieder; von Philipsborn, Gerda; Mueller, Claus D.; and Lenke, Dieter, 4,329,352, Cl. 424-267.000.

Leo, Bruno S., to Hughes Aircraft Company. Screw compressor-expander cryogenic system with magnetic coupling. 4,328,684, Cl. 62-402.000.

Leonard, James G.: *See—*
Kiernan, James G.; and Leonard, James G., 4,328,824, Cl. 137-99.000.

Lester, George R.; and Welsh, Lawrence B., to UOP Inc. Integral shaped replication supports. 4,329,260, Cl. 252-446.000.

Leutenegger, Willi: *See—*
Zurbuchen, Jacques; and Leutenegger, Willi, 4,329,146, Cl. 8-580.000.

Levenson, Leonard L.: *See—*
Kny, Erich; James, William J.; Levenson, Leonard L.; and Auerbach, Robert A., 4,329,418, Cl. 430-270.000.

Lever Brothers Company: *See—*
Cox, Roger B.; and Steer, David C., 4,329,448, Cl. 536-123.000.
Eymond, Philip R. N.; and Butterworth, Robert M., 4,329,245, Cl. 252-102.000.

Leverenz, Klaus: *See—*
Reel, Henning; and Leverenz, Klaus, 4,329,283, Cl. 260-156.000.

Levolor Lorentzen, Inc.: *See—*
Anderle, Joseph A., 4,328,653, Cl. 52-460.000.

Levy, Joseph: *See—*
Kwong, Gary W. Y.; and Levy, Joseph, 4,329,505, Cl. 564-476.000.

Lewis, Gary L.: *See—*
Berg, Howard M.; and Lewis, Gary L., 4,329,190, Cl. 156-60.000.

Lewis, Norris E., to Litton Systems, Inc. Gas filled high voltage slip ring assembly. 4,329,004, Cl. 339-5.00M.

Leybold-Heraeus: *See—*
Sommerkamp, Peter; and Heil, Walter, 4,328,763, Cl. 118-727.000.

Leybold-Heraeus GmbH & Co. KG: *See—*
Reimpell, Uwe; Grein, Lutz; Reiter, Reinhard; and Stark, Friedrich, 4,328,947, Cl. 251-80.000.

Li, Kwok-Leung: *See—*
Hirschowitz, Barry H.; and Li, Kwok-Leung, 4,328,809, Cl. 128-653.000.

Liang, Shou C., to Cominco Ltd. Attachment of solder preform to a cover for a sealed container. 4,328,921, Cl. 228-222.000.

Libertini, Zoltan L.; Duly, Alan R.; and White, Steven D., to Avco Corporation. Electrode structure for a high temperature capacitance probe for sensing turbine speed. 4,329,644, Cl. 324-160.000.

Libicky, Arnost; and Mueller, Walter E., to Ciba-Geigy AG. Method and apparatus for regenerating photographic processing solution. 4,329,042, Cl. 354-324.000.

Liedtke, Karl-Heinz: *See—*
Betsch, Helmut; Goertler, Horst; Liedtke, Karl-Heinz; Prohaska, Hans; and Rachner, Horst, 4,329,631, Cl. 318-466.000.

Lilburn, Jennifer E., to Chevron Research Company. Lubricating oil compositions containing dispersant additives. 4,329,240, Cl. 252-51.50A.

Lin, Chia-Cheng: *See—*
Neely, James E., Jr.; Moff, Annette; Lin, Chia-Cheng; and Falleroni, Charlene A., 4,329,327, Cl. 423-314.000.

Lin, Yang-i: *See—*
Lang, Stanley A., Jr.; Lin, Yang-i; and Ridge, David N., 4,329,463, Cl. 544-405.000.

Linde Aktiengesellschaft: *See—*
Pocrnja, Anton; Bolkart, Alfred; and Dworschak, Josef, 4,328,675, Cl. 60-676.000.

Linde, Rolf: *See—*
Dallas, William J.; Linde, Rolf; and Weiss, Hermann, 4,329,020, Cl. 350-162.0SF.

Linden, Heinrich: *See—*
Eschwey, Helmut; Galinke, Joachim, deceased; Galinke, Renate, nee Jansen, heir; Linden, Heinrich; Wegemund, Bernd; and Wiemers, Norbert, 4,329,381, Cl. 427-386.000.

Lingl Corporation: *See—*
Lingl, Hans, 4,328,724, Cl. 83-23.000.

Lingl, Hans, to Lingl Corporation. Method and apparatus for cutting brick mouldings from a clay strand. 4,328,724, Cl. 83-23.000.

Lipschutz, Paul, to Neiman S.A. Electrically actuated lock. 4,328,693, Cl. 70-431.000.

Litton Systems, Inc.: *See—*
Lewis, Norris E., 4,329,004, Cl. 339-5.00M.

Littwin, Burkhard, to Siemens Aktiengesellschaft. Control plate for a flat plasma screen. 4,329,617, Cl. 313-268.000.

Liu, Shing-Hou: *See—*
Ho, T. L.; and Liu, Shing-Hou, 4,329,508, Cl. 568-361.000.

Liu, Thomas M. H.; Reamer, Robert A.; Shinkai, Ichiro; and Sletzinger, Meyer, to Merck & Co., Inc. Process for the preparation of N-protected N-formimidoyl 2-aminoethanethiol. 4,329,481, Cl. 556-410.000.

Ljungstrom, Olle. Wind turbine of cross-flow type. 4,329,116, Cl. 416-19.000.

Lodge & Shipley Company, The: *See—*
Glover, Charles G., 4,329,112, Cl. 414-751.000.

Loebner, William. Lighted disco dance floor. 4,329,739, Cl. 362-153.000.

Logan, Emanuel L., to Reliable Security Systems, Inc. Timing apparatus for delaying opening of doors. 4,328,985, Cl. 292-201.000.

Logie, James A.; and Wilson, Arthur G., to Exxon Research & Engineering Co. Facsimile method and apparatus for setting white level. 4,329,717, Cl. 358-282.000.

Logus, Anthony T., to Pettibone Corporation. Winch with compact, high efficiency and high ratio gearing suitable for free fall. 4,328,954, Cl. 254-344.000.

Lohr, Delmar F., Jr., to Firestone Tire & Rubber Company, The. Process for polymerizing dienes. 4,329,439, Cl. 525-180.000.

Long, Paul V.: *See—*
Charbonnier, Francis M.; and Long, Paul V., 4,328,808, Cl. 128-419.00D.

Long, Robert: *See—*
Cooley, Edmund A.; Long, Robert; and Ness, Phillip D., 4,329,094, Cl. 408-77.000.

Look, Christopher M.: *See—*
Noad, Julian P.; Springthorpe, Anthony J.; and Look, Christopher M., 4,329,189, Cl. 148-171.000.

Loose, Richard D., to General Motors Corporation. Belt clamping retractor. 4,328,933, Cl. 242-107.200.

LoPiano, Rocco W. Sacral topical hyperbaric oxygen chambers. 4,328,799, Cl. 128-207.260.

Lord Corporation: *See—*
Kny, Erich; James, William J.; Levenson, Leonard L.; and Auerbach, Robert A., 4,329,418, Cl. 430-270.000.

Lorenz, Horst: *See—*
Poque, Dionysius J.; Freudenstein, Georg; and Lorenz, Horst, 4,328,852, Cl. 152-359.000.

Lostak, Charles: *See—*
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,329,193, Cl. 156-162.000.

Lotte Co., Ltd.: *See—*
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,329,369, Cl. 426-3.000.

Lou, Kingdon; and Burton, Tracey L., to ICL Scientific. Stable diagnostic reagent and method for qualitative determinations of streptococci infections. 4,329,151, Cl. 23-230.00B.

Lovrich, Vincent; and Sundell, George J., to Autographic Business Forms, Inc. Check-digit printing means. 4,329,572, Cl. 235-92.0EC.

Lubrizol Corporation, The: *See—*
Forsberg, John W., 4,329,249, Cl. 252-34.700.

Lucas, Donald K. Fish ringer. 4,328,916, Cl. 224-103.000.

Lucas Industries Limited: *See—*
Irons, Brian P. G., 4,329,007, Cl. 339-188.00R.
Ironside, John M., 4,328,775, Cl. 123-339.000.
Tumber, Brian W.; and Davison, Michael J., 4,328,697, Cl. 73-3.000.

Lucas, Joseph E., to Marine Engineering Company, C.A. Tilt-up/jack-up off-shore drilling apparatus and method. 4,329,088, Cl. 405-196.000.

Luccarelli, Domenick, Jr.: *See—*
Klemarczyk, Philip T.; Schmitt, Frederick L.; Granda, Edward J.; and Luccarelli, Domenick, Jr., 4,329,373, Cl. 426-538.000.

Lucerne Products, Inc.: *See—*
Wied, Julius P., 4,329,555, Cl. 200-157.000.

Luke, Richard F. Conveyor belt scraper blades. 4,328,888, Cl. 198-499.000.

Lummus Company, The: *See—*
Riegel, Herbert; Strangio, Vincent; and Sze, Morgan C., 4,329,525, Cl. 570-191.000.

Lund, Harold, to Eikonix Corporation. Controlling translation. 4,328,713, Cl. 74-479.000.

Lundborg, Hans: *See—*
Kristensen, Leif; Lundborg, Hans; and Nyqvist, Stig, 4,328,753, Cl. 102-275.500.

Lunden, Richard W.: *See—*
Beach, David L.; Lunden, Richard W.; and Zambelli, Adolfo, 4,329,255, Cl. 252-429.00B.

Lunn, William H. W., to Eli Lilly and Company. Cephalosporin compounds. 4,329,454, Cl. 544-026.000.

Luthi, Robert B.; and Williams, Clair E., to Siliconix, Incorporated. Carrier and test socket for leadless integrated circuit. 4,329,642, Cl. 324-158.00F.

Lutz, Paul: *See—*
Rust, Kurt; Brinkmann, Ludwig; and Lutz, Paul, 4,329,256, Cl. 252-429.00B.

Luyckx, Marcel G. M.: *See—*
Stokbroekx, Raymond A.; Willems, Joannes J. M.; and Luyckx, Marcel G. M., 4,329,353, Cl. 424-267.000.

Lvovich, Florenty I.: *See—*
Druzhinin, Ernest A.; Kubasov, Vladimir L.; Busse-Machukas, Vladimir B.; Lvovich, Florenty I.; Krongauz, Evgeny L.; and Jurkov, Leonid I., 4,329,219, Cl. 204-290.00F.

Lyons, William C.; and Scurlock, Scot L., to Drilling Development, Inc. Flexible drill pipe. 4,328,839, Cl. 138-120.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Schramm, Peter, 4,328,748, Cl. 101-365.000.
Wegel, Erich, 4,328,961, Cl. 271-236.000.

Maasberg, Wolfgang: *See—*
Huperz, Adalbert; and Maasberg, Wolfgang, 4,328,778, Cl. 123-385.000.

Machlowitz, Roy A.; McAleer, William J.; and Miller, William J., to Merck & Co., Inc. Macroscopic method for determining cytopathic effects in viral assay. 4,329,424, Cl. 435-5.000.

Machmerth, Herbert; Mann, Georg; and Salzmann, Gerhard, to Ernst Leitz Wetzlar GmbH. Reduction gear. 4,328,711, Cl. 74-194.000.

Mack, Heinz; and Singer, Gunter, to Heinz Mack. Apparatus to register the movements of the lower jaw with reference to the skull. 4,328,620, Cl. 33-174.00D.

Mackowiak, David E.: *See—*
Homeier, Edwin H.; Imai, Tamotsu; Mackowiak, David E.; and Guzolek, Catherine E., 4,329,521, Cl. 568-909.000.

Madge, Joachim; Adamski, Gunter; and Prochnow, Claus. Camera hand grip. 4,329,041, Cl. 354-293.000.

Maeno, Hiroo: *See—*
Asada, Kosaku; and Maeno, Hiroo, 4,328,838, Cl. 138-118.100.

Maestrone, Thomas F.: *See—*
Hyner, Jacob; Gradowski, Stephen; and Maestrone, Thomas F., 4,329,402, Cl. 428-621.000.

Mahon, Michael J.; and Shanks, Roy R., to Burroughs Corporation. Controlled selective disconnect system for wafer scale integrated circuits. 4,329,685, Cl. 340-825.840.

Mai, Herbert: *See—*
Hillenbrand, Bernhard; Mai, Herbert; and Schuster, Karl, 4,329,626, Cl. 315-169.400.

Mai, Tu X., to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Stepping motor. 4,329,601, Cl. 310-49.00R.

Maida, Osamu, to Nippon Kogaku K.K. Power supply circuit for camera. 4,329,036, Cl. 354-60.00A.

Maiocco, Guiseppe, to Arman S.p.A. Antitheft device for motor vehicles. 4,328,688, Cl. 70-252.000.

Makk, Antal: *See—*
Szego, Ferenc; and Makk, Antal, 4,329,338, Cl. 424-180.000.

Malcolm, David H., to Electrogasdynamics, Inc. Method of electrostatically enhancing deposition of air borne spray materials. 4,328,940, Cl. 244-136.000.

Malinouskas, Donald: *See—*
Hill, Jeremy R.; and Malinouskas, Donald, 4,328,810, Cl. 128-680.000.

Mallinckrodt, Inc.: *See—*
Jackson, Isaac S.; and Tilford, L. Nelson, 4,329,314, Cl. 264-519.000.

Mallory, William R.: *See—*
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,329,362, Cl. 424-320.000.

Manchester, Robert L., to Interflow Systems Corporation. Cabinet-suspension system. 4,329,003, Cl. 312-245.000.

Mandet, Gerard M. F.: *See—*
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,329,113, Cl. 415-116.000.

Mangrobang, Maurice G.; and Waas, Charles W., to Communications Technology Corporation. Crimp-type cable shield bonding device. 4,329,537, Cl. 174-84.00C.

Mann, Egon; and Eymuller, Helmut, to Zahnradfabrik Friedrichshafen AG. Hydrostatic-mechanical drive for vehicular cement mixers. 4,329,064, Cl. 366-61.000.

Mann, Georg: *See—*
Machmerth, Herbert; Mann, Georg; and Salzmann, Gerhard, 4,328,711, Cl. 74-194.000.

Manna, Albert, to Caterpillar Tractor Co. Micromotion multiplier. 4,328,719, Cl. 74-845.000.

Manno, Scott E., Sr. Magnetic board game. 4,328,970, Cl. 273-239.000.

Manson, Morris, to Corax Corporation. Slide brackets. 4,328,998, Cl. 308-3.800.

Manucuso, Eltore J., Jr.: *See—*
Nelson, Lawrence; Gardy, Victor R.; Habersthol, August J.; Manucuso, Eltore J., Jr.; and O'Brien, John F., 4,328,737, Cl. 89-33.0CA.

Manville Service Corporation: *See—*
Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., 4,329,193, Cl. 156-162.000.

Mao, George W.; Rao, Purushothama; Marsh, Frederick L.; and Dunlevey, Francis M., to Gould Inc. Lead oxide composition for use in lead-acid batteries. 4,329,408, Cl. 429-228.000.

Marcade, Roque D., to Whirlpool Corporation. Dishwasher dispenser control. 4,329,596, Cl. 307-141.800.

Maremont Corporation: *See—*
Gonwa, Charles J.; Baker, Kenneth L.; and Sieloff, Ronald A., 4,328,696, Cl. 72-389.000.

Marine Engineering Company, C.A.: *See—*
Lucas, Joseph E., 4,329,088, Cl. 405-196.000.

Marique, Christian: *See—*
Crahay, Jean; Marique, Christian; Bonnarens, Henri; DeFraye, Rene; and Bragard, Adolphe, 4,329,562, Cl. 219-121.0LJ.

Markezich, Ronald L., to General Electric Company. Halo-(carbonyldioxyaryl)ethylenes. 4,329,287, Cl. 549-241.000.

Markl, Georg, to Te Ka de Felten & Guilleaume Fernmeldeanlagen GmbH. Signal-light systems, especially for a series of emergency-phone stations distributed along the length of a highway, or the like. 4,329,677, Cl. 340-84.000.

Marsh, Frederick L.: *See—*
Mao, George W.; Rao, Purushothama; Marsh, Frederick L.; and Dunlevey, Francis M., 4,329,408, Cl. 429-228.000.

Martenson, Donald S. Portable paper burning cookstove. 4,328,783, Cl. 126-25.00R.

Martin, Paul F. Multi-modal low noise incubator. 4,328,793, Cl. 128-1.00B.

Martin, Roland, to Ateliers des Charmilles, S.A. Apparatus and process for preventing rupture of the wire electrode of an EDM travelling wire apparatus. 4,329,558, Cl. 219-69.00W.

Maruta, Masatosi, to Kizai Kabushiki Kaisha. Neutral tin electroplating baths. 4,329,207, Cl. 204-54.00L.

Maruyama, Chisato. Immunotherapeutic agent for tumors comprising lipopolysaccharide as an active component. 4,329,452, Cl. 536-119.000.

Maruyama, Masaaki. Die-head of cutting machine. 4,329,093, Cl. 408-15.000.

Marx, Alvin J.; and Wobschall, Darold C., to Marx, Alvin J. Automated intravenous fluid regulating and administering apparatus. 4,328,800, Cl. 128-214.00E.

Marx, Alvin J.; and Friedman, William D., to Marx, Alvin J. Automated intravenous fluid regulating and administering apparatus. 4,328,801, Cl. 128-214.00E.

Massachusetts Institute of Technology: *See—*
Vayenas, Costas G.; and Stoukides, Michael, 4,329,208, Cl. 204-59.00R.

Massari, Frank. Phillips screwdriver with retractable slotted screw driver blade. 4,328,721, Cl. 81-439.000.

Massart, Rene, to Agence Nationale de Valorisation de la Recherche (ANVAR). Magnetic fluids and process for obtaining them. 4,329,241, Cl. 252-62.520.

Masuda, Michio; Nabeyama, Hiroaki; and Kurita, Toshiyuki, to Hitachi, Ltd. Solid-state color imaging device. 4,329,709, Cl. 358-44.000.

Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, to Canon Kabushiki Kaisha. Distance detecting device and a focus control system utilizing the same. 4,329,033, Cl. 354-25.000.

Matsui, Hisanori: *See—*
Yabutani, Kunihiro; Matsui, Hisanori; Tanaka, Hiroshi; and Kurono, Hitoshi, 4,329,479, Cl. 549-39.000.

Matsui, Takeshi: *See—*
Kuno, Akira; Matsui, Takeshi; and Shinoda, Yoshio, 4,328,776, Cl. 123-352.000.

Matsumura, Koichi: *See—*
Miyashita, Osamu; Matsumura, Koichi; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,329,460, Cl. 544-301.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ishihara, Shin-ichiro; Mori, Koshiro; Tanaka, Tsuneo; Nagata, Seiichi; and Fukai, Masakazu, 4,329,699, Cl. 357-2.000.
Kawai, Senji; Morimoto, Yoshihumi; Watanabe, Masayuki; Yamaya, Hiroshi; Kurohata, Hitoshi; and Nakamura, Joji, 4,329,665, Cl. 333-182.000.
Sugino, Takashi; Ito, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,329,661, Cl. 372-46.000.
Yamada, Akitoshi, 4,329,544, Cl. 179-1.0VE.

Matsushita Electronics Corporation: *See—*
Kimura, Masamichi, 4,329,619, Cl. 313-470.000.

Matsuura, Tsuyoshi: *See—*
Aihara, Mamoru; Takahashi, Yutaka; Nakajima, Yoshio; and Matsuura, Tsuyoshi, 4,329,030, Cl. 354-23.00D.

Matthews, Hugh B., to Sperry Corporation. Geothermal pump dual cycle system. 4,328,673, Cl. 60-641.400.

Matyus, Peter: *See—*
Szilagyi, Geza; Matyus, Peter; Kasztreiner, Endre; Balogh, Tibor; and Ila, Lajos, 4,329,457, Cl. 544-114.000.

Mau-Tung, Do; and Lam, Do M., to Societe Probio DMS. Apparatus for determining the behavior of a liquid during coagulation and the like. 4,328,701, Cl. 73-59.000.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See—*
Schaefer, Fritz-Peter; and Jasny, Jan, 4,329,055, Cl. 356-346.000.

Maxted, Wesley R. Conveyor means. 4,328,889, Cl. 198-367.000.

McAleer, William J.: *See—*
Machlowitz, Roy A.; McAleer, William J.; and Miller, William J., 4,329,424, Cl. 435-5.000.

McAlister, Eugene S., to Minnesota Mining and Manufacturing Company. Synthetic fiber surface-modification process. 4,329,391, Cl. 428-265.000.

McAnespie, Patrick; Dyer, Alan; and Mehta, Bharati J., to National Research Development Corporation. Method of synthesizing zincosilicate or stannosilicate or titanosilicate material. 4,329,328, Cl. 423-333.000.

McBride, Joan: *See—*
McBride, Thomas D., 4,328,953, Cl. 254-134.30R.

McBride, Thomas D., to McBride, Joan. Portable cylinder with multi-use removable attachments. 4,328,953, Cl. 254-134.30R.

McCall, John M., to Upjohn Company, The. Tetrahydrobenzopyran derivatives. 4,329,459, Cl. 544-264.000.

McCann's Engineering & Manufacturing Company: *See—*
Verley, Donald, 4,329,550, Cl. 200-84.00C.

McClain, Dorothee M., to National Distillers & Chemical Corp. Process for the preparation of finely divided thermoplastic resin. 4,329,304, Cl. 264-8.000.

McClain, Dorothee M., to National Distillers & Chemical Corp. Process for regulating the particle size distribution of self-dispersing ionically crosslinked thermoplastic polymer. 4,329,305, Cl. 264-8.000.

McClure, John W.; and Hudson, George S., to Avco Corporation. Thrust measuring test stand. 4,328,703, Cl. 73-117.400.

McCombs, Charles A., to Eastman Kodak Company. Process for preparing 17α-hydroxy-20-ketosteroids. 4,329,294, Cl. 260-397.400.

McConnell, Lorne D., to Gould Inc. Wire formed interleaved spring contact structure. 4,329,552, Cl. 200-147.00R.

McConnell, Richard L.: *See—*
Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., 4,329,270, Cl. 524-518.000.

McCracken, William E.: *See—*
Hakes, Gary A.; and McCracken, William E., 4,328,994, Cl. 299-11.000.

McDonald, Gerald H.; and Hagen, Donald R., to Resistance Technology, Inc. Potentiometer. 4,329,676, Cl. 338-198.000.

McDonough, Robert M.; Hanson, Thomas E.; Brill, Richard H.; and Oates, Ronald W., to SCM Corporation. Coffee maker with a variable brew strength apparatus. 4,328,740, Cl. 99-295.000.

McKenna, Eva J., to Union Carbide Corporation. Method for measuring biomass viability. 4,329,232, Cl. 210-614.000.

McKernan, Patrick F.: *See—*
Teass, Horace A., Jr.; and McKernan, Patrick F., 4,329,650, Cl. 324-450.000.

McLaughlin, James S.: *See—*
Hackman, Edward B.; Zeagler, Larry D.; McLaughlin, James S.; and Peabody, Carl M., 4,329,511, Cl. 568-454.000.

McLaughlin, John T. Identification device for hospital patients. 4,328,978, Cl. 283-7.000.

McLean, John R., to Reynolds Metals Company. Hydraulic motion amplifier. 4,328,670, Cl. 60-543.000.

McManigal, Paul G. M.: *See—*
Reisman, Elias; Wilson, S. Kirby; McManigal, Paul G. M.; and Goldberg, Lawrence L., 4,328,938, Cl. 244-3.100.

McNab Incorporated: *See—*
Teass, Horace A., Jr.; and McKernan, Patrick F., 4,329,650, Cl. 324-450.000.

McSwain, Edward D. Temperature responsive ventilator construction. 4,328,927, Cl. 236-49.000.

Mead Corporation, The: *See—*
Denlinger, George W.; Wiley, Robert A.; and Yu, James H., 4,329,696, Cl. 346-75.000.
Neff, Robert G.; Miller, Garth H.; Pate, Denson C., Jr.; and Williams, John L., Jr., 4,328,924, Cl. 229-43.000.
Oliff, James R.; and Wood, Prentice J., 4,328,893, Cl. 206-435.000.

Meckler, Milton. Peltier freeze concentration process. 4,328,677, Cl. 62-124.000.

Medi-Pack Limited: *See—*
Beard, Michael J., 4,328,907, Cl. 221-63.000.

Medtronic, Inc.: *See—*
Jirak, Thomas L.; and Beert, Frank C., 4,328,807, Cl. 128-419.0PG.
Ray, Charles D., 4,328,813, Cl. 128-791.000.
Ufford, Keith A.; and O'Neill, Edward G., 4,328,812, Cl. 128-786.000.

Megles, John E., Jr.: *See—*
Ference, Joseph; Megles, John E., Jr.; and Rittler, Hermann L., 4,329,400, Cl. 428-426.000.

Mehta, Bharat M.: *See—*
Webb, Jimmy L.; and Mehta, Bharat M., 4,329,291, Cl. 549-241.000.

Mehta, Bharati J.: *See—*
McAnespie, Patrick; Dyer, Alan; and Mehta, Bharati J., 4,329,328, Cl. 423-333.000.

Meisenburg, Ewald: *See—*
Dolkemeyer, Wilfried; Erdt, Kurt; Hentges, Rene; and Meisenburg, Ewald, 4,329,329, Cl. 423-461.000.

Melamed, Avraham: *See—*
Wirguin, Joseph M.; and Melamed, Avraham, 4,328,788, Cl. 126-415.000.

Meldahl, Robert D.; and Borel, Robert J., to J. A. Masterson & Co. Clutch employing articulated clutch shoes and flyweights. 4,328,884, Cl. 192-105.0CF.

Melton, Warren J., III. Universal quick release mounting assembly. 4,328,915, Cl. 224-32.00R.

Melvold, Robert W.; Vrolyk, John J.; and Smith, George H., to Rockwell International Corporation. Hole plugging system. 4,329,132, Cl. 425-13.000.

Memminger GmbH: *See—*
Memminger, Gustav; Fecker, Josef; and Flister, Wilfried, 4,328,929, Cl. 242-47.010.

Memminger, Gustav; Fecker, Josef; and Flister, Wilfried, to Memminger GmbH. Yarn delivery apparatus for use with textile machines. 4,328,929, Cl. 242-47.010.

Mengshoel, Hans C.; and Opsvik, Peter. Sitting device. 4,328,991, Cl. 297-271.000.

Merchant, Vijay; Henriksen, Stephen R.; Boucher, R. Wayne; and Dodd, Jerrold J., to Becker, Robert W., a part interest. Method of regenerating etchant and recovering etched metal. 4,329,210, Cl. 204-107.000.

Merck & Co., Inc.: *See—*
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,329,465, Cl. 546-072.000.
Baldwin, John J.; and Ponticello, Gerald S., 4,329,351, Cl. 424-263.000.
Dorn, Conrad P.; and Jones, Howard, 4,329,363, Cl. 424-320.000.
Liu, Thomas M. H.; Reamer, Robert A.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,329,481, Cl. 556-410.000.
Machlowitz, Roy A.; McAleer, William J.; and Miller, William J., 4,329,424, Cl. 435-5.000.
Utne, Torleif; and Jobson, Ronald B., 4,329,469, Cl. 546-203.000.

Merenyi, Gabor: *See—*
Wladimiroff, Wladimir; and Merenyi, Gabor, 4,329,316, Cl. 422-52.000.

Merlin Gerin: *See—*
Bernard, Georges; and Leclercq, Pierre, 4,329,551, Cl. 200-147.00R.

Merouge, Gilbert: *See—*
Allegre, Jean; Merouge, Gilbert; and Ruelle, Gilbert, 4,329,609, Cl. 310-183.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
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Meulenberg, Andrew, Jr., to Communications Satellite Corporation. Discharge suppressing dielectric film for use on spacecraft surfaces. 4,329,731, Cl. 361-218.000.

Meyer, Hartmut, to Siemens Aktiengesellschaft. Conductor bar of an electric machine. 4,329,538, Cl. 174-119.00R.

Meyer, Max F., Jr.; McConnell, Richard L.; and Joyner, Frederick B., to Eastman Kodak Company. Compositions containing plasticized poly(vinyl chloride) which compositions have improved physical properties. 4,329,270, Cl. 524-518.000.

Michaud, Reginal O. Vehicle mounted carrier assembly. 4,328,914, Cl. 224-31.000.•

Michel, Karl H.: *See—*
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Middleman, Lee M.; Evans, Joseph H.; and Pettengill, Donald F., to Raychem Corporation. Circuit protection devices comprising PTC elements. 4,329,726, Cl. 361-58.000.

Midland-Ross Corporation: *See—*
Hanula, Richard M., 4,328,900, Cl. 213-62.00A.

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Miki, Hisaya: *See—*
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Orlando, Samuel J.; and Miller, Charles M., Jr., 4,328,967, Cl. 273-63.00G.

Miller, Garth H.: *See—*
Neff, Robert G.; Miller, Garth H.; Pate, Denson C., Jr.; and Williams, John L., Jr., 4,328,924, Cl. 229-43.000.

Miller, Jack V., to Acroform Corporation. Bow saw. 4,328,848, Cl. 145-33.00R.

Miller, John C.; and Burnett, Archibald L., to Union Carbide Corporation. Apparatus and method for extruding ethylene polymers. 4,329,313, Cl. 264-349.000.

Miller, Lester E. Bucket loader attachment. 4,329,103, Cl. 414-24.500.

Miller, William J.: *See—*
Machlowitz, Roy A.; McAleer, William J.; and Miller, William J., 4,329,424, Cl. 435-5.000.

Milligan, Barton; and Grandin, Roland E., to Air Products and Chemicals, Inc. Synthesis of alkyl amino benzenes from alkyl diamino benzenes. 4,329,501, Cl. 564-305.000.

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Minoura, Kazuo; Kiyohara, Takehiko; and Uchiyama, Haruo, to Canon Kabushiki Kaisha. Two-dimensional scanning device. 4,329,012, Cl. 350-6.800.

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Mitrofanova, Alla K.; and Zelenskaya, Militsa N. Antifriction paste and solid antifriction coating prepared from same. 4,329,238, Cl. 252-12.000.

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Miura, Motohisa, to Nippondenso Co., Ltd. Secondary air supply system for internal combustion engines. 4,328,668, Cl. 60-290.000.
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Mollura, Carlos A. Firmness regulated waterbed mattress. 4,328,599, Cl. 5-451.000.
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Dufour, Daniel L., 4,329,272, Cl. 524-288.000.
Rawlinson, George R., 4,329,196, Cl. 156-243.000.
Montagu, Jean I., to General Scanning, Inc. Electric motor construction. 4,329,606, Cl. 310-71.000.
Monte, Anthony J.; and Wahoski, Ernest C., to United States of America, Army. Fire suppressant impact diffuser. 4,328,868, Cl. 169-62.000.
Monteath, George D.; and Jones, Arthur H., to British Broadcasting Corporation. Apparatus using a light sensing system for sensing time modulated information from a light emitting device. 4,329,684, Cl. 340-707.000.
Montesi, Vittorio; and Besi, Mario, to Societa Italiana Telecomunicazioni Siemens S.p.A. Interface unit for pushbutton selector. 4,329,546, Cl. 179-81.00R.
Montgomery, Carroll S., to American Cyanamid Company. Recycling techniques in the production of 6-hydroxy-2-naphthoic acid. 4,329,494, Cl. 562-425.000.
Moon, John D.: *See—*
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Moore, David L.; Ostop, John A.; and Johnson, Joseph E., to Westinghouse Electric Corp. Glass-sealed power thyristor. 4,329,707, Cl. 357-73.000.
Moore, Henry J., Jr.; and Bressickello, Lindy J., to Mor-Flo Industries, Inc. Gas supplemented solar collector storage means. 4,328,791, Cl. 126-427.000.
Mor-Flo Industries, Inc.: *See—*
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Morrill, Charles D.; Des Lierres, John M.; and Copeland, Louis E., to Smith International, Inc. Connection of underwater lines. 4,329,085, Cl. 405-169.000.
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., to Burroughs Wellcome Co. 2-Amino-4-(substituted hydrazino)-6-oxo pyrimidines. 4,329,362, Cl. 424-320.000.
Mort, Dewey F., to General Motors Corporation. Vacuum power system and regulator therefor. 4,328,669, Cl. 60-397.000.
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Mourou, Gerard, to University of Rochester, The. Methods and apparatus for generating microwave pulses and for the measurement and control thereof. 4,329,686, Cl. 343-6.00R.
Moy, David, to Halcon SD Group, Inc., The. Process for preparing acetaldehyde. 4,329,512, Cl. 568-484.000.
Moyroud, Louis M., to Autologic, S.A. Photocomposing machine and method. 4,329,026, Cl. 354-5.000.
Moyroud, Louis M.; Bongard, Michel; Vernez, Paul A.; and Moulin, Michel, to Autologic, S.A. Photocomposing machine and method. 4,329,027, Cl. 354-5.000.

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Muller, Frank A., to Scripto, Inc. Initially erasable ink composition for a ball point writing instrument. 4,329,262, Cl. 523-161.000.
Muller, Frank A., to Scripto, Inc. Ballpoint writing instrument containing an initially erasable ink. 4,329,264, Cl. 523-162.000.
Murakami, Hiroyasu; Uchidoi, Masanori; Yamamichi, Masayoshi; Shinoda, Nobuhiko; Suzuki, Masayuki; and Ito, Tadashi, to Canon Kabushiki Kaisha. Camera with program system. 4,329,034, Cl. 354-37.000.
Murakami, Nanami: *See*—
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Murata Manufacturing Co., Ltd.: *See*—
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Murphy, John J., to Westinghouse Electric Corp. Automatic tipping-off apparatus for a high-intensity-discharge arc tube. 4,329,166, Cl. 65-270.000.
Murphy, Walter T., to B. F. Goodrich Company, The. Antifouling polyurethanes. 4,329,277, Cl. 523-122.000.
Murray, Bruce J.: *See*—
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Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation catalyst and methods for producing and employing same. 4,329,531, Cl. 585-268.000.
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Nagata, Shigeyoshi; and Hotta, Koji, to Oval Engineering Company Limited. Flow meter with helical toothed rotors having no pulsation and zero contact pressure. 4,329,130, Cl. 418-150.000.
Nagatani, Toshio; Habu, Takeshi; and Takahashi, Kazuo, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material and method of forming high contrast silver images. 4,329,417, Cl. 430-264.000.
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Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, to Otsuka Pharmaceutical Co., Ltd. 3,4-Dihydrocarbostyril derivatives. 4,329,468, Cl. 546-158.000.
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Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Automatic focusing camera equipped with self-timer. 4,329,038, Cl. 354-195.000.
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Nambu, Masao, to Nippon Oil Co., Ltd. Traction fluids for traction drive transmissions. 4,329,529, Cl. 585-20.000.
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McClain, Dorothee M., 4,329,305, Cl. 264-8.000.
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National Starch and Chemical Corporation: *See*—
Chiu, Chung-Wai; and Krieg, Walter J., 4,329,181, Cl. 106-213.000.
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Zenk, Meinhard; Etschenberg, Eugen; and Graf, Erich, 4,329,361, Cl. 424-317.000.
Naumovich, Nicholas P., Jr., to Parsec, Inc. Insulated structure and method for insulating a structure. 4,328,652, Cl. 52-408.000.
Naylor, Donald B.; and Baker, Richard R., to British-American Tobacco Company Limited. Smoking articles. 4,328,817, Cl. 131-360.000.
Neely, James E., Jr.; Moff, Annette; Lin, Chia-Cheng; and Falleroni, Charlene A., to PPG Industries, Inc. Method for making B-form aluminum trimetaphosphate from powder reactants. 4,329,327, Cl. 423-314.000.
Neff, Robert G.; Miller, Garth H.; Pate, Denson C., Jr.; and Williams, John L., Jr., to Mead Corporation, The. Article container. 4,328,924, Cl. 229-43.000.
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Lipschutz, Paul, 4,328,693, Cl. 70-431.000.
Nelle, Gunther; and Oberhans, Johann, to Johannes Heidenhain GmbH. Lamp support apparatus. 4,329,736, Cl. 362-23.000.
Nelson, David H., to American Solar. Solar tracking drive mechanism. 4,328,789, Cl. 126-425.000.
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Beardl, James D.; Nelson, Donald J.; Haller, Kirk J.; and Bowers, Kenneth E., 4,328,887, Cl. 198-396.000.
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Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Reel weight assembly. 4,328,932, Cl. 242-71.800.
Nelson, Thomas J., to Atlantic Richfield Company. Catalytic reforming process with liquid phase sulfur removal. 4,329,220, Cl. 208-89.000.
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Hood, Richard A.; Greig, Dale C.; and Nemecek, Ralph E., 4,328,630, Cl. 37-129.000.
Neri, Rudolph O.; and Topliss, John G., to Schering Corporation. Antiandrogenic agents and methods for the treatment of androgen dependent disease states. 4,329,364, Cl. 424-324.000.
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Stievenart, Emile F.; Plessers, Hendrik S.; Hellemans, Julianus J.; and Neujens, Georges J., 4,329,589, Cl. 250-468.000.
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Neuner, Terry E.; and Gresham Michael E. Mixing machine. 4,329,068, Cl. 366-214.000.
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Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,329,280, Cl. 260-97.600.
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Ito, Tsuneo; and Kagawa, Junichi, 4,329,174, Cl. 420-433.000.
Nickel, William F. Shellfish mariculture method and apparatus. 4,328,764, Cl. 119-4.000.
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Muller, Erich; Nickl, Josef; Roch, Josef; Narr, Berthold; Haarmann, Walter; and Weisenberger, Johannes M., 4,329,347, Cl. 424-251.000.
Niedermeyer, William P.: *See—*
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Nield, Gerald L.: *See—*
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Nieminen, Timo, to Syntex (U.S.A.) Inc. Device for supporting patient in panoramic X-ray radiography. 4,329,587, Cl. 250-439.00P.
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Yabutani, Kunihiro; Matsui, Hisanori; Tanaka, Hiroshi; and Kurono, Hitoshi, 4,329,479, Cl. 549-39.000.
Niida, Chiaki: *See—*
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Ninomiya, Ichiro, to Sony Corporation. Apparatus for generating time code signals. 4,329,719, Cl. 360-14.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kamiya, Shingo, 4,329,657, Cl. 330-297.000.
Takeda, Toshio; Amano, Takehisa; Isii, Sigeki; and Hamada, Seiya, 4,328,732, Cl. 84-1.170.
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Fukino, Kunihiro; and Ishizaka, Sunao, 4,329,040, Cl. 354-286.000.
Maida, Osamu, 4,329,036, Cl. 354-60.00A.
Nippon Kokan Kabushiki Kaisha: *See—*
Ouchi, Chiaki; and Sampei, Tetsuya, 4,329,172, Cl. 75-124.000.
Nippon Oil Co., Ltd.: *See—*
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Sato, Atushi; Shimizu, Isoo; Endo, Keizi; and Yanagishita, Hitoshi, 4,329,536, Cl. 174-25.00C.
Nippon Soken, Inc.: *See—*
Akita, Sigeyuki; and Kitagawa, Junji, 4,328,706, Cl. 73-493.000.
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,328,779, Cl. 123-416.000.
Kawai, Hisasi; Morino, Seiji; Fukami, Akira; and Hamaguchi, Hiroshi, 4,328,771, Cl. 123-179.0BG.
Kikuchi, Tetsuro; Sasaya, Hideaki; and Ishihara, Yasumasa, 4,329,047, Cl. 356-28.000.
Kuno, Akira; Matsui, Takeshi; and Shinoda, Yoshio, 4,328,776, Cl. 123-352.000.
Tanaka, Akira; Hattori, Tadashi; and Nishida, Minoru, 4,329,615, Cl. 313-141.000.
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Nippon Speng Co., Ltd.: *See—*
Ushioda, Bunnosuke; and Nakamura, Nobuyasu, 4,329,187, Cl. 148-9.00R.
Nippon Telegraph & Telephone Public Corp.: *See—*
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Iwata, Yasuhiro; Usami, Kiyoshi; Naganoma, Masanori; Nabeta, Teiichi; and Kojima, Yasuhumi, 4,328,855, Cl. 165-2.000.
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Nishida, Minoru: *See—*
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Nishigaki, Yuji: *See—*
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Nishimura, Shinichi; and Hanamura, Yoshihiko, to Tokyo Kogaku Kikai Kabushiki Kaisha. Eye fundus camera having a fluorescent photographing device. 4,329,025, Cl. 351-7.000.
Nishimura, Yoshiyuki, to Kobe Steel Limited. Method for preventing a leakage loss of gases in a screw compressor. 4,329,126, Cl. 418-1.000.
Nishitani, Yorimitsu: *See—*
Yano, Mitsuhiro; Nishi, Hiroshi; Takusagawa, Masahito; and Nishitani, Yorimitsu, 4,329,660, Cl. 372-46.000.
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Andoh, Naoki; Nishiwaki, Itsuo; and Arakawa, Masatoshi, 4,329,492, Cl. 560-205.000.
Nishizawa, Jun-ichi; Okuno, Yasuo; and Takahashi, Keishiro, to Zaidan Hojin Handotai Kenkyu Shinkokai. Light-responsive light-emitting diode display. 4,329,625, Cl. 315-158.000.
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Takase, Sadao, 4,329,645, Cl. 324-166.000.
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Nitro Nobel AB: *See—*
Kristensen, Leif; Lundborg, Hans; and Nyqvist, Stig, 4,328,753, Cl. 102-275.500.
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Noad, Julian P.; Springthorpe, Anthony J.; and Look, Christopher M., to Northern Telecom Limited. Channelled substrate double heterostructure lasers. 4,329,189, Cl. 148-171.000.
Noda, Fumio; Hayashi, Kazuya; Mogi, Keitaro; Iwaasa, Takashi; Mizunuma, Takeji; and Sakasai, Toshio, to Kikkoman Shoyu Co. Ltd. Process for producing solid koji. 4,329,370, Cl. 426-46.000.
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Noll, Burton A.; and Suhey, Richard P., to Corning Glass Works. Mounting device for heat recovery wheels. 4,328,857, Cl. 165-8.000.
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Normark, Olov M. Coupling between mechanical elements. 4,328,980, Cl. 285-341.000.
North, Thomas M. Beverage carrier. 4,328,902, Cl. 220-23.400.
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Noad, Julian P.; Springthorpe, Anthony J.; and Look, Christopher M., 4,329,189, Cl. 148-171.000.
Northrup, Karl A.: *See—*
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Nunes, Abner H. Vertical plural tubular vault burial system. 4,328,606, Cl. 27-35.000.
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Oates, Ronald W.: *See—*
McDonough, Robert M.; Hanson, Thomas E.; Brill, Richard H.; and Oates, Ronald W., 4,328,740, Cl. 99-295.000.
Oates, Ronald W., Sr.; and Fagan, John C., to SCM Corporation. Pinch valve. 4,328,834, Cl. 137-636.100.
Obenshain, David N., to Westvaco Corporation. Method for making ozone. 4,329,212, Cl. 204-157.10R.
Oberg, James L.; Curran, Roger J.; and Czayka, Michael, to Bangor Punta Corporation. Plastic coated ammunition and methods of manufacture. 4,328,750, Cl. 102-514.000.
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O'Brien, Donald L.: *See—*
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Offermanns, Walter, to Siemens Aktiengesellschaft. Circuit arrangement for storing the phase of an a-c voltage. 4,329,653, Cl. 328-155.000.
Ogawa, Shuji: *See—*
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Ogle, H. Malcolm: *See—*
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Ogle, James A.: *See—*
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Ohanian, Walter. Adjustable foot stool. 4,328,992, Cl. 297-439.000.
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Ohmstedt, Harry O.; Ruth, William H.; and Krulls, Gerd E., to General Electric Company. Brushholder apparatus for dynamoelectric machine. 4,329,611, Cl. 310-227.000.
Ohmura, Jukichi: *See—*
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Okumura, Shuji: *See*—
Inada, Masami; Kitamura, Kazuhiko; Okumura, Shuji; Nonoyama, Takao; and Tsuji, Riichi, 4,328,832, Cl. 137-625.460.
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Olde Savannah Arms Company: *See*—
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Olenberg, Harry: *See*—
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Oliff, James R.; and Wood, Prentice J., to Mead Corporation, The. Bottle carrier. 4,328,893, Cl. 206-435.000.
Olin Corporation: *See*—
Knollmueller, Karl O., 4,329,485, Cl. 556-458.000.
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Rothgery, Eugene F., 4,329,475, Cl. 548-141.000.
Oliver, Roy N. Removable core cylinder lock. 4,328,690, Cl. 70-369.000.
Olofsson Corporation, The: *See*—
Garnett, Donald W., 4,328,723, Cl. 82-36.00R.
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., to SKF Kugellagerfabriken GmbH. Linear motion rolling bearing. 4,328,999, Cl. 308-6.00C.
Olsen, Arthur A., to Ball Corporation. Strip-field spectroradiometer. 4,329,050, Cl. 356-305.000.
Olympus Optical Company, Ltd.: *See*—
Aihara, Mamoru; Takahashi, Yutaka; Nakajima, Yoshio; and Matsuura, Tsuyoshi, 4,329,030, Cl. 354-23.00D.
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Orito, Yoshio; Imai, Sumi; and Niwa, Shuichi, to Director-General of Agency of Industrial Science and Technology. Method for the asymmetric hydrogenation of α-ketoesters. 4,329,487, Cl. 560-60.000.
Orlando, Samuel J.; and Miller, Charles M., Jr., to Columbia Industries, Inc. Lightweight bowling ball. 4,328,967, Cl. 273-63.00G.
O'Rourke, J. Cam; Pilkington, G. Roger; and Bercha, Frank G., to Dome Petroleum Limited. Skirt construction. 4,328,760, Cl. 114-67.00A.
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Arpasi, Miklos; and Rakar, Geza, 4,328,704, Cl. 73-151.000.
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Hajos, Zoltan G., 4,329,288, Cl. 549-363.000.
Orthwein, William C. Anti-buckling device for mine-roof bolting machines. 4,328,872, Cl. 173-160.000.
Osborn, Charles, to JSJ Corporation. Lockout for gimbal-type automotive transmission gear shifter. 4,328,712, Cl. 74-476.000.
Osborn, Jack. Valve system for vacuum cleaner. 4,329,161, Cl. 55-96.000.
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Oswald, Gerald L., to Atlas Powder Company. Electronic delay blasting circuit. 4,328,751, Cl. 102-220.000.
Othmer, Donald F. Desulfurization of coal. 4,329,156, Cl. 44-1.0SR.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, 4,329,468, Cl. 546-158.000.
Ouchi, Chiaki; and Sampei, Tetsuya, to Nippon Kokan Kabushiki Kaisha. High manganese nonmagnetic steel having excellent machinability. 4,329,172, Cl. 75-124.000.
Outboard Marine Corporation: *See*—
Andis, Matthew L., 4,328,616, Cl. 30-225.000.
Seyerle, Carl E., 4,328,659, Cl. 56-11.800.
Oval Engineering Company Limited: *See*—
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Owada, Takeyoshi; and Suzuki, Yasuro, to Hitachi, Ltd. Submersible motor apparatus. 4,329,122, Cl. 417-365.000.
Owen, Douglas B., to Clayware Pty. Ltd. Coal burning grate. 4,328,786, Cl. 126-174.000.
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Russell, Robert G., 4,329,163, Cl. 65-2.000.
Owens-Illinois, Inc.: *See*—
Rapp, Charles F., 4,329,535, Cl. 136-259.000.
Ozawa, Masaru; Ooba, Yuji; and Shimizu, Toshio, to Nippon Telegraph & Telephone Public Corp. Recording paper capable of recording images in two colors. 4,328,977, Cl. 282-27.500.
Pace Incorporated: *See*—
Vella, Alexander J., 4,328,920, Cl. 228-20.000.
Pachmayr, Frank A.; and Farrar, Jack R., to Pachmayr Gun Works, Inc. Gun with cushioned forend. 4,328,633, Cl. 42-74.000.
Pachmayr Gun Works, Inc.: *See*—
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Elward, John R., 4,328,891, Cl. 206-158.000.
Palitex Project-Company GmbH: *See*—
Kallmann, Jurgen, 4,328,663, Cl. 57-279.000.
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Rochricht, Julianna; Kisfaludy, Lajos; Kajtar, Marton; Palosi, Eva; and Szporny, Laszlo, 4,329,341, Cl. 424-244.000.
PanCanadian Petroleum Limited: *See*—
Cymbalisty, Lubomyr M. O.; and Shaw, Robert C., 4,328,710, Cl. 73-863.860.
Pape, Lawrence G., to Opthalmic Systems, Inc. Ophthalmological procedures. 4,328,803, Cl. 128-276.000.
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Spencer, Harvey J.; and Niedermeyer, William P., 4,328,655, Cl. 53-439.000.
Parekh, Bhupendra M.: *See*—
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Park, John N., to General Electric Company. Single transistor power control circuit for a DC motor washing machine drive. 4,329,630, Cl. 318-258.000.
Park, Kyong: *See*—
Kavli, Fred; Park, Kyong; and Affel, John J., 4,329,732, Cl. 361-283.000.
Parker, Ernest G., to International Telephone and Telegraph Corporation. Multiple shipboard antenna configuration. 4,329,690, Cl. 343-709.000.
Parker-Hannifin Corporation: *See*—
Albertson, Kenneth R.; and Peterson, Ralph E., 4,328,972, Cl. 277-1.000.
Becktel, Robert L.; Greenwell, Robert P.; and Tilling, Basil B., 4,328,844, Cl. 141-302.000.
Parkinson, Jonathan J., to Societe Soletanche. Methods of laying underground conduits. 4,329,083, Cl. 405-154.000.
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Forgues, Louis V., 4,329,128, Cl. 418-83.000.
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Parsons, Zane W. Tamper sensor system. 4,329,681, Cl. 340-568.000.
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Neff, Robert G.; Miller, Garth H.; Pate, Denson C., Jr.; and Williams, John L., Jr., 4,328,924, Cl. 229-43.000.
Patterson, Albert E.; and Pollard, Timothy C., to C. E. Pollard Company. Dropside pickup. 4,328,988, Cl. 296-10.000.
Pattison, Jack E. Fluid pressure intensifier. 4,328,671, Cl. 60-563.000.
Paulson, Jerome T.: *See*—
Buschbom, Floyd E.; Hansen, Glen D.; Paulson, Jerome T.; and Anderson, Clifton W., 4,329,105, Cl. 414-316.000.
Pauze', Denis R.: *See*—
Zamek, Otto S.; Pauze', Denis R.; and Jablonski, Richard J., 4,329,397, Cl. 428-379.000.
Pav, Josef; and Junk, Dieter, to Kleinewefers GmbH. Roll for use in calenders or the like. 4,328,744, Cl. 100-162.00B.
Payview Limited: *See*—
Cheung, William S. H., 4,329,711, Cl. 358-114.000.
PDI, Inc.: *See*—
Palmer, Lewis B., 4,329,247, Cl. 252-104.000.
Peabody, Carl M.: *See*—
Hackman, Edward B.; Zeagler, Larry D.; McLaughlin, James S.; and Peabody, Carl M., 4,329,511, Cl. 568-454.000.

Pearl, David R., to Gerber Garment Technology, Inc. Apparatus and method for working on successive segments of sheet material. 4,328,726, Cl. 83-39.000.

Pearl, David S., II, to Uniweld Products, Incorporated. Fluid line coupling with self-adjusting valve depressor for refrigeration refrigerant testing and charging hoses. 4,328,948, Cl. 251-149.600.

Pecherer, Benjamin: *See*—
Christenson, James G.; and Pecherer, Benjamin, 4,329,281, Cl. 260-112.00B.

Pennsylvania Engineering Corporation: *See*—
Robert, Edgardo J., 4,329,171, Cl. 75-51.000.

Pennwalt Corporation: *See*—
Shapiro, Leonard, 4,328,925, Cl. 233-7.000.

Perelli, Marvin P., to International Harvester Company. Implement with wing lift including toggle links and roller. 4,328,869, Cl. 172-311.000.

Perkin-Elmer Corporation, The: *See*—
Buckley, W. Derek, 4,329,410, Cl. 430-5.000.
Chamran, Morteza M.; Scott, Larkin B.; and Williams, Paul B., 4,329,051, Cl. 356-320.000.

Perkins, William J., to General Motors Corporation. Battery container mold. 4,328,945, Cl. 249-67.000.

Perlstein, Jerome H.: *See*—
Detty, Michael R.; Goliber, Thomas E.; Murray, Bruce J.; and Perlstein, Jerome H., 4,329,284, Cl. 260-239.00R.

Petersen, Kjell B.: *See*—
Bruff, William; and Petersen, Kjell B., 4,328,787, Cl. 126-343.50A.

Petersen, Louis P., to General Electric Company. Continuous process for preparing acyloxysilanes. 4,329,484, Cl. 556-442.000.

Peterson, Edwin R. Retractable leash collar. 4,328,767, Cl. 119-109.000.

Peterson, Ralph E.: *See*—
Albertson, Kenneth R.; and Peterson, Ralph E., 4,328,972, Cl. 277-1.000.

Petrek, John P.; and Cantrell, Clifford M. Multiple effect thin film distillation system. 4,329,204, Cl. 202-174.000.

Petri, Heinz: *See*—
Astrupgaard, Svend; and Petri, Heinz, 4,328,759, Cl. 112-316.000.

Petrie, Ivan L., to Deere & Company. Pressure vessel. 4,328,836, Cl. 138-30.000.

Petro-Canada Exploration Inc.: *See*—
Cymbalisty, Lubomyr M. O.; and Shaw, Robert C., 4,328,710, Cl. 73-863.860.

Petroleum Physics Corporation: *See*—
Freedman, Robert, 4,329,647, Cl. 324-323.000.

Pettengill, Donald F.: *See*—
Middleman, Lee M.; Evans, Joseph H.; and Pettengill, Donald F., 4,329,726, Cl. 361-58.000.

Pettibone Corporation: *See*—
Logus, Anthony T., 4,328,954, Cl. 254-344.000.

Pews, R. Garth, to Dow Chemical Company, The. Method and product for treating soil to suppress the nitrification of ammonium nitrogen therein. 4,329,491, Cl. 560-174.000.

Pfaff Industriemaschinen GmbH: *See*—
Astrupgaard, Svend; and Petri, Heinz, 4,328,759, Cl. 112-316.000.

Pfeffer, Heinrich A.: *See*—
Valentian, Dominique R.; Bartoli, Cesare M.; Pfeffer, Heinrich A.; Herhudt v. Rohden, Hans-Joachim; and Stewart, Duncan, 4,328,667, Cl. 60-202.000.

Pfizer Inc.: *See*—
Bindra, Jasjit S., 4,329,495, Cl. 562-426.000.
Fenton, Dennis M., 4,329,429, Cl. 435-207.000.

Philips Industries, Inc.: *See*—
Ranz, James R., 4,329,118, Cl. 416-178.000.
Scott, Roger P.; and Kahle, W. Wayne, 4,328,644, Cl. 49-501.000.

Phillips, Edward H.; and Wise, Lawrence A., to Optimetrix Corporation. Shock and vibration isolation system. 4,328,941, Cl. 248-550.000.

Phillips Petroleum Company: *See*—
Fenstermaker, Roger W., 4,328,995, Cl. 299-17.000.
Murtha, Timothy P.; and Zuech, Ernest A., 4,329,531, Cl. 585-268.000.

Pickford, Nigel E., to Imperial Chemical Industries Limited. Heat-bondable laminates of polyester and metal foil and containers made from them. 4,329,395, Cl. 428-344.000.

Pifferi, Giorgio: *See*—
Bolis, Goffredo; Giani, Roberto; Pinza, Mario; Pifferi, Giorgio; and Broccali, Giampietro, 4,329,285, Cl. 260-239.100.

Pilkington, G. Roger: *See*—
O'Rourke, J. Cam; Pilkington, G. Roger; and Bercha, Frank G., 4,328,760, Cl. 114-67.00A.

Pilkington P.E. Limited: *See*—
Rogers, Philip J., 4,329,024, Cl. 350-465.000.

Pimlott, John R.: *See*—
Sorenson, Marius W.; Ezzell, Bobby R.; and Pimlott, John R., 4,329,218, Cl. 204-283.000.

Pinckard, R. Neal: *See*—
Hanahan, Donald J.; and Pinckard, R. Neal, 4,329,302, Cl. 260-925.000.

Pinza, Mario: *See*—
Bolis, Goffredo; Giani, Roberto; Pinza, Mario; Pifferi, Giorgio; and Broccali, Giampietro, 4,329,285, Cl. 260-239.100.

Pirio, Marcel R.: *See*—
Singh, Prithipal; and Pirio, Marcel R., 4,329,502, Cl. 564-349.000.

Pitcher, Wayne H., Jr., to Corning Glass Works. Diesel particulate trap. 4,329,162, Cl. 55-523.000.

Pitney Bowes Inc.: *See*—
Hooper, Clinton E., 4,329,566, Cl. 219-216.000.

Plantes, William J.; Goldstein, Robert P.; and Wolfe, Jerome K., to Westinghouse Electric Corporation. Simplified maintenance electrocoagulator. 4,329,211, Cl. 204-149.000.

Plessers, Hendrik S.: *See*—
Stievenart, Emile F.; Plessers, Hendrik S.; Hellemans, Julianus J.; and Neujens, Georges J., 4,329,589, Cl. 250-468.000.

Plug, Jan: *See*—
Van Ginkel, Mannes; and Plug, Jan, 4,328,654, Cl. 53-285.000.

Plummer, Ernest L., to FMC Corporation. Insecticidal [1,1'-biphenyl]-3-ylmethyl esters. 4,329,518, Cl. 568-807.000.

Pocrnja, Anton; Bolkart, Alfred; and Dworschak, Josef, to Linde Aktiengesellschaft. Method of recovering power in a counterpressure-steam system. 4,328,675, Cl. 60-676.000.

Pohl, Daniel P.: *See*—
Truskolaski, Bernard S.; and Pohl, Daniel P., 4,329,382, Cl. 428-4.000.

Pohl, Gerhard: *See*—
Werle, Peter; and Pohl, Gerhard, 4,329,519, Cl. 568-854.000.

Pokorny, Richard J., to Minnesota Mining and Manufacturing Company. High adhesion plugging and encapsulating polyurethane prepared from a polyol, a tri or tetra functional aliphatic polyol and a monofunctional aliphatic alcohol. 4,329,442, Cl. 528-49.000.

Polaroid Corporation: *See*—
Carcia, Peter P.; Whiteside, George D.; and Woodbury, Arthur N., 4,329,031, Cl. 354-23.00D.
Johnson, Bruce K., 4,329,140, Cl. 431-359.000.
Land, Edwin H., 4,329,411, Cl. 430-30.000.

Polite, Richard H., Jr. Device for cutting caulking nozzles. 4,328,910, Cl. 222-81.000.

Pollard, Timothy C.: *See*—
Patterson, Albert E.; and Pollard, Timothy C., 4,328,988, Cl. 296-10.000.

Pond, Charles R.; Texeira, Patrick D.; and Wilbert, Reynold E., to Boeing Company, The. Multiple channel interferometer. 4,329,059, Cl. 356-353.000.

Ponitzsch, Werner; Reccius, Helmut; and Fehlings, Herbert, to Dornier GmbH. Hand drill. 4,329,092, Cl. 408-11.000.

Ponsard, Jean-Marie M. G.: *See*—
Bollen, Romain L. F.; and Ponsard, Jean-Marie M. G., 4,329,670, Cl. 335-56.000.

Ponsy, Jacques: *See*—
Le Grouyellec, Andre; and Ponsy, Jacques, 4,329,318, Cl. 422-59.000.

Ponticello, Gerald S.: *See*—
Baldwin, John J.; and Ponticello, Gerald S., 4,329,351, Cl. 424-263.000.

Popper Engineering Ltd.: *See*—
Popper, Jakhin B., 4,328,944, Cl. 248-593.000.

Popper, Jakhin B., to Popper Engineering Ltd. Load supporting device. 4,328,944, Cl. 248-593.000.

Poque, Dionysius J.; Freudenstein, Georg; and Lorenz, Horst, to Uniroyal Englebert. Pneumatic vehicle tire employing cords having a single wire filament core and a mantle. 4,328,852, Cl. 152-359.000.

Porco, Daniel A. Combination television picture projection screen unit and ornamental cover unit therefor. 4,329,716, Cl. 358-231.000.

Post, Martin F. M.: *See*—
Conn, Paul J.; and Post, Martin F. M., 4,329,532, Cl. 585-407.000.

Postolov, Petr M.: *See*—
Akopov, Ernest M.; and Postolov, Petr M., 4,328,805, Cl. 128-334.00R.

Power Engineering and Manufacturing, Ltd.: *See*—
Herscovici, Saul, 4,329,096, Cl. 409-15.000.

PPG Industries, Inc.: *See*—
DuBois, Donald W., 4,329,216, Cl. 204-252.000.
Johnson, Harlan B., 4,329,209, Cl. 204-98.000.
Neely, James E., Jr.; Moff, Annette; Lin, Chia-Cheng; and Falleroni, Charlene A., 4,329,327, Cl. 423-314.000.
Rau, Frederick C., 4,329,165, Cl. 65-134.000.

Prella, Giovanni: *See*—
Invernizzi, Rutillio; and Prella, Giovanni, 4,329,374, Cl. 426-582.000.

Premerlani, William J., to General Electric Company. Directional power distance relay. 4,329,727, Cl. 361-80.000.

Presto, Douglas A., to Budd Company, The. Plastic door for an automobile. 4,328,642, Cl. 49-502.000.

Prewitt, Thomas A., to General Motors Corporation. AM-FM Broadband vehicle windshield mounted radio antenna. 4,329,691, Cl. 343-713.000.

Priam Corporation: *See*—
West, Terence H., 4,329,722, Cl. 360-98.000.

Pridy, Whetstine B. Connector assembly. 4,329,124, Cl. 417-545.000.

Priel, Ury; Gray, Jerry D.; and Frederick, Allen H., to Monolithic Memories, Inc. Lateral PNP transistor. 4,329,703, Cl. 357-35.000.

Priluck, David M.: *See*—
Wagner, James B.; and Priluck, David M., 4,329,592, Cl. 290-40.00R.

Princiotto, Theodore, Jr.: *See*—
Cikut, John J.; Crane, Irving D., Jr.; and Princiotto, Theodore, Jr., 4,329,234, Cl. 210-752.000.

Pritchard, Dalton H., to RCA Corporation. Audio distortion eliminator. 4,329,714, Cl. 358-198.000.

Prochnow, Claus: *See*—
Madge, Joachim; Adamski, Gunter; and Prochnow, Claus, 4,329,041, Cl. 354-293.000.

Procter & Gamble Company, The: *See—*
Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., 4,329,246, Cl. 252-103.000.

Prohaska, Hans: *See—*
Betsch, Helmut; Goertler, Horst; Liedtke, Karl-Heinz; Prohaska, Hans; and Rachner, Horst, 4,329,631, Cl. 318-466.000.

Proskow, Stephen: *See—*
Goff, David L.; Yuan, Edward L.; and Proskow, Stephen, 4,329,419, Cl. 430-283.000.

Prunella, Wallace R.: *See—*
Rigg, George P.; Cornsweet, Tom N.; Rough, J. Kirkwood H.; Ogle, H. Malcolm; Prunella, Wallace R.; and Schiller, Lawrence H., 4,329,049, Cl. 356-124.000.

Purex Corporation: *See—*
Aurther, William B., 4,328,833, Cl. 137-625.470.

Pyramid Technologies, Inc.: *See—*
Foerster, Gerhard A., 4,328,631, Cl. 40-373.000.

Pysz, John F.: *See—*
Bagley, Melvin R.; Crocker, Burton B.; and Pysz, John F., 4,329,526, Cl. 570-203.000.

Quick, William H.: *See—*
James, Kenneth A.; Quick, William H.; and Strahan, Virgil H., 4,329,058, Cl. 356-352.000.

Quin, Michael J. Conveyor system. 4,329,230, Cl. 210-413.000.

Rachner, Horst: *See—*
Betsch, Helmut; Goertler, Horst; Liedtke, Karl-Heinz; Prohaska, Hans; and Rachner, Horst, 4,329,631, Cl. 318-466.000.

Radeck, Fritz: *See—*
Voelker, Wolfgang; Schmitt, Alfons; and Radeck, Fritz, 4,329,377, Cl. 427-9.000.

Radke, Matthias: *See—*
Sittardt, Hans-Gunter; and Radke, Matthias, 4,329,319, Cl. 422-224.000.

Rakar, Geza: *See—*
Arpasi, Miklos; and Rakar, Geza, 4,328,704, Cl. 73-151.000.

Ramadorai, Gopalan; and Shaw, Douglas R., to United States Borax & Chemical Corporation. Flotation of molybdenite. 4,329,223, Cl. 209-167.000.

Randle, James N., to British Leyland UK Limited. Pneumatic tire. 4,328,851, Cl. 152-330.0RF.

Ranz, James R., to Philips Industries, Inc. Centrifugal blower wheels. 4,329,118, Cl. 416-178.000.

Rao, Purushothama: *See—*
Mao, George W.; Rao, Purushothama; Marsh, Frederick L.; and Dunlevey, Francis M., 4,329,408, Cl. 429-228.000.

Rapistan, Inc.: *See—*
Vander Meer, Clayton H.; and Doane, Martin R., 4,329,576, Cl. 235-489.000.

Rapp, Charles F., to Owens-Illinois, Inc. Solar cells and collector structures. 4,329,535, Cl. 136-259.000.

Rau, Frederick C., to PPG Industries, Inc. Method for enhanced melting of glass batch and apparatus therefor. 4,329,165, Cl. 65-134.000.

Raudonat, Ullrich: *See—*
Kloevekorn, Volker; and Raudonat, Ullrich, 4,329,687, Cl. 343-13.00R.

Rawlinson, George R., to Monsanto Company. Method of making a three-dimensional laminate. 4,329,196, Cl. 156-243.000.

Ray, Charles D., to Medtronic, Inc. Brain lead anchoring system. 4,328,813, Cl. 128-791.000.

Raychem Corporation: *See—*
Middleman, Lee M.; Evans, Joseph H.; and Pettengill, Donald F., 4,329,726, Cl. 361-58.000.

Raytheon Company: *See—*
Lanciano, Ralph L., 4,329,620, Cl. 313-478.000.
Zampiello, Albert N., 4,329,057, Cl. 356-350.000.

RCA Corporation: *See—*
Allaroyce, Gerald M.; Moskalczak, Ronald N.; and Gronka, Edward A., 4,329,648, Cl. 324-404.000.
Bell, Alan E., 4,329,697, Cl. 346-135.100.
Chang, Kern K. N., 4,329,618, Cl. 313-431.000.
Clayton, Richard W., 4,329,724, Cl. 360-109.000.
Gross, Josef; and Barkow, William H., 4,329,671, Cl. 335-213.000.
Harford, Jack R., 4,329,713, Cl. 358-174.000.
Kaganowicz, Grzegorz, 4,328,646, Cl. 51-281.00R.
Knight, Peter R., 4,329,729, Cl. 361-91.000.
Lang, Frank B., 4,329,712, Cl. 358-128.500.
Pritchard, Dalton H., 4,329,714, Cl. 358-198.000.
Roach, William R., 4,329,575, Cl. 235-487.000.
Schelhorn, Robert L., 4,328,614, Cl. 29-842.000.
Stewart, Roger G., 4,329,600, Cl. 307-540.000.
Wallace, Lloyd F., 4,329,702, Cl. 357-31.000.

Reamer, Robert A.: *See—*
Liu, Thomas M. H.; Reamer, Robert A.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,329,481, Cl. 556-410.000.

Reardon, Joseph E., to Du Pont de Nemours, E. I., and Company. Molding components. 4,329,276, Cl. 524-502.000.

Reardon, Joseph E., to Du Pont de Nemours, E. I., and Company. Molding compositions. 4,329,278, Cl. 524-523.000.

Reccius, Helmut: *See—*
Ponitzsch, Werner; Reccius, Helmut; and Fehlings, Herbert, 4,329,092, Cl. 408-11.000.

Recycled Paper Bedding, Inc.: *See—*
Whiteman, Patrick W., 4,328,913, Cl. 222-413.000.

Reeberg, Christiaan. Hold steady straps. 4,328,917, Cl. 224-254.000.

Reed, Michael A., to Koolatron Industries, Ltd. Thermoelectric environmental chamber. 4,328,676, Cl. 62-3.000.

Reel, Henning; and Leverenz, Klaus, to Bayer Aktiengesellschaft. Hydroxypyridone azo dyestuffs. 4,329,283, Cl. 260-156.000.

Rees, James D.; Simpson, George R.; and Bliek, David C., to Xerox Corporation. Illumination system for microfilm printer. 4,329,045, Cl. 355-67.000.

Reilly, Edward J., to Gould Inc. Stepper motor damping circuit. 4,329,635, Cl. 318-696.000.

Reimpell, Uwe; Grein, Lutz; Reiter, Reinhard; and Stark, Friedrich, to Leybold-Heraeus GmbH & Co. KG. Pendulum gate valve. 4,328,947, Cl. 251-80.000.

Reiner, Hans; and Auth, Werner, to ITT Industries, Incorporated. Very large scale integrated circuit. 4,329,640, Cl. 324-73.00R.

Reinheimer, Gunter; and Gaul, Norbert, to Ernst Leitz Wetzlar GmbH. Incident light illumination instrument for selective light and dark field illumination. 4,329,014, Cl. 350-89.000.

Reisman, Arnold: *See—*
Crowder, Billy L.; and Reisman, Arnold, 4,329,706, Cl. 357-71.000.

Reisman, Elias; Wilson, S. Kirby; McManigal, Paul G. M.; and Goldberg, Lawrence L., to Ford Aerospace & Communications Corp. Roll reference sensor. 4,328,938, Cl. 244-3.100.

Reiter, Reinhard: *See—*
Reimpell, Uwe; Grein, Lutz; Reiter, Reinhard; and Stark, Friedrich, 4,328,947, Cl. 251-80.000.

Reliable Security Systems, Inc.: *See—*
Logan, Emanuel L., 4,328,985, Cl. 292-201.000.

Rempfler, Hermann; and Fory, Werner, to Ciba-Geigy Corporation. Pyridyloxy-phenoxyalkanecarboxylic acid derivatives. 4,329,167, Cl. 71-94.000.

Remy, David C.: *See—*
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,329,465, Cl. 546-072.000.

Rendoll Paper Corporation: *See—*
Froom, Thomas W., 4,328,656, Cl. 53-458.000.

Rengo Co., Ltd.: *See—*
Tokuno, Masateru, 4,328,727, Cl. 83-106.000.

Renshaw, Alan: *See—*
Snook, Martin; Rideout, James M.; and Renshaw, Alan, 4,329,061, Cl. 356-414.000.

Renz, George H. Water closet flushing valve. 4,328,596, Cl. 4-324.000.

Resistance Technology, Inc.: *See—*
McDonald, Gerald H.; and Hagen, Donald R., 4,329,676, Cl. 338-198.000.

Resnick, Bruce M., to GAF Corporation. Benzophenones and their use as fungicides. 4,329,360, Cl. 424-314.000.

Revelle, William F. Rope wick. 4,328,640, Cl. 47-1.500.

Reynolds Metals Company: *See—*
McLean, John R., 4,328,670, Cl. 60-543.000.

Ricci, Giorgio; and Federici, Giorgio, to Biodata S.p.A. Method for determination of transaminases and relative diagnostic kit. 4,329,425, Cl. 435-16.000.

Richter Gedeon Vegyeszeti Gyar R.T.: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,329,350, Cl. 424-258.000.

Richter Gedeon Vegyeszeti Gyar Rt: *See—*
Rochricht, Julianna; Kisfaludy, Lajos; Kajtar, Marton; Palosi, Eva; and Szporny, Laszlo, 4,329,341, Cl. 424-244.000.
Szilagyi, Geza; Matyus, Peter; Kasztreiner, Endre; Balogh, Tibor; and Ila, Lajos, 4,329,457, Cl. 544-114.000.

Richter, Henning; and Brocks, Klaus, to Aero Aqua AG. Device for absorbing heat from the earth. 4,328,858, Cl. 165-45.000.

Ricoh Company, Ltd.: *See—*
Kaneko, Hirokazu, 4,329,039, Cl. 354-266.000.
Namiki, Ryoichi; and Higashi, Yuichiro, 4,329,565, Cl. 219-216.000.
Tanikawa, Kiyoshi; Yoshikawa, Masao; and Sato, Tsutomu, 4,329,416, Cl. 430-133.000.

Rideout, James M.: *See—*
Snook, Martin; Rideout, James M.; and Renshaw, Alan, 4,329,061, Cl. 356-414.000.

Ridge, David N.: *See—*
Lang, Stanley A., Jr.; Lin, Yang-i; and Ridge, David N., 4,329,463, Cl. 544-405.000.

Riebel, Klaus; Alberts, Heinrich; Bartl, Herbert; Mietzsch, Fritz; and Steffen, Ulrich, to Bayer Aktiengesellschaft. Process for the preparation of ethylene-vinyl ester graft polymer dispersions. 4,329,267, Cl. 523-323.000.

Riedl, Josef: *See—*
Kuhn, Wenzel; Riedl, Josef; and Widmann, Peter, 4,329,527, Cl. 570-245.000.

Riegel, Herbert; Strangio, Vincent; and Sze, Morgan C., to Lummus Company, The. Production of chlorinated compounds by use of molten salts. 4,329,525, Cl. 570-191.000.

Ries, Charles R.: *See—*
Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., 4,329,246, Cl. 252-103.000.

Rigg, George P.; Cornsweet, Tom N.; Rough, J. Kirkwood H.; Ogle, H. Malcolm; Prunella, Wallace R.; and Schiller, Lawrence H., to Rodenstock Instruments Corporation. Median point detecting apparatus for a lensmeter. 4,329,049, Cl. 356-124.000.

Riley, Leon H.; and Edlin, George R., to United States of America, Army. Fiber optic, liquid crystal display electrical measurement system. 4,329,580, Cl. 250-215.000.

Riley, Michael W.: *See—*
Gunderman, Robert J.; and Riley, Michael W., 4,328,901, Cl. 220-88.00A.

Ringwald, Erwin, to Sandoz Ltd. Thiazoline and imidazoline derivatives useful as antidepressants. 4,329,354, Cl. 424-270.000.

Ringwood, Alfred E., to Australian National University, The. Process for the treatment of high level nuclear wastes. 4,329,248, Cl. 252-628.000.
Riordan, William J., to Walter Kidde and Company, Inc. Proving system for fuel burner blower. 4,329,138, Cl. 431-90.000.
Ritchie, Ian C. Locking device. 4,328,687, Cl. 70-34.000.
Rittler, Hermann L.: *See—*
Ference, Joseph; Megles, John E., Jr.; and Rittler, Hermann L., 4,329,400, Cl. 428-426.000.
Roach, William R., to RCA Corporation. Video disc having a label for identifying material recorded thereon. 4,329,575, Cl. 235-487.000.
Roane, Asa E., to United States of America, Army. TNT State sensor. 4,329,131, Cl. 425-6.000.
Robb, Wayne F.: *See—*
Hutchison, V. James; and Robb, Wayne F., 4,328,605, Cl. 24-115.00G.
Robert Bosch GmbH: *See—*
Hagenlocher, Walter; Hesse, Heinz; Sohnle, Rudiger; Kleebaur, Karl; and Kugel, Christoph, 4,329,608, Cl. 310-91.000.
Ishizuka, Yutaka; and Kobayashi, Shinichi, 4,329,129, Cl. 418-138.000.
Jundt, Werner; and Roozenbeek, Herman, 4,328,782, Cl. 123-609.000.
Robert, Edgardo J., to Pennsylvania Engineering Corporation. Steel making method. 4,329,171, Cl. 75-51.000.
Robin, Jacques B.: *See—*
Rocher, Pierre M.; and Robin, Jacques B., 4,329,568, Cl. 219-497.000.
Robinson, Joseph K.; Vander Graff, Max; and De Marais, Joseph R., to Emerson Electric Co. Variable oscillator drive mechanism. 4,328,718, Cl. 74-833.000.
Robles, Leon G. Plastic bag sealer. 4,329,197, Cl. 156-583.400.
Roch, Josef: *See—*
Muller, Erich; Nickl, Josef; Roch, Josef; Narr, Berthold; Haarmann, Walter; and Weisenberger, Johannes M., 4,329,347, Cl. 424-251.000.
Rochefort, Malcolm P.: *See—*
Gavens, Paul D.; and Rochefort, Malcolm P., 4,329,252, Cl. 252-429.00B.
Rocher, Pierre M.; and Robin, Jacques B. Apparatus for heat treatment, particularly the asepticization, of contact lenses. 4,329,568, Cl. 219-497.000.
Rochricht, Julianna; Kisfaludy, Lajos; Kajtar, Marton; Palosi, Eva; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 5-Phenyl-1,3,4,5-tetrahydro-2H-1,4-benzodiazepin-2-ones, and pharmaceutical compositions containing them. 4,329,341, Cl. 424-244.000.
Rockwell-Golde, a Gesellschaft mit beschrankter Haftung: *See—*
Bohm, Horst, 4,329,594, Cl. 307-10.00R.
Rockwell International Corporation: *See—*
Christe, Karl O.; and Wilson, Richard D., 4,329,330, Cl. 423-473.000.
James, Kenneth A.; Quick, William H.; and Strahan, Virgil H., 4,329,058, Cl. 356-352.000.
Melvold, Robert W.; Vrolyk, John J.; and Smith, George H., 4,329,132, Cl. 425-13.000.
Rodenstock Instruments Corporation: *See—*
Rigg, George P.; Cornsweet, Tom N.; Rough, J. Kirkwood H.; Ogle, H. Malcolm; Prunella, Wallace R.; and Schiller, Lawrence H., 4,329,049, Cl. 356-124.000.
Rodler, Waldo E., Jr.; and Campbell, Howard H., to FMC Corporation. Inflatable bow. 4,328,601, Cl. 114-353.000.
Rogemoser, David R.: *See—*
Williams, Roy C.; and Rogemoser, David R., 4,329,490, Cl. 560-90.000.
Rogers, Charles W.: *See—*
Green, Andrew; Rogers, Charles W.; and Upton, Clarence D., 4,329,194, Cl. 156-179.000.
Rogers, Philip J., to Pilkington P.E. Limited. Objective lenses. 4,329,024, Cl. 350-465.000.
Rogic, Milorad M.: *See—*
Demmin, Timothy R.; and Rogic, Milorad M., 4,329,498, Cl. 562-553.000.
Rohm and Haas Company: *See—*
Rousseau, Gerard; and Lamotte, Claude, 4,329,183, Cl. 127-46.200.
Rohrer, Douglas D., to Eaton Corporation. Fluid coupling device and bimetal coil mounting arrangement. 4,328,881, Cl. 192-58.00B.
Roland, Michel: *See—*
Couvreur, Patrick; Roland, Michel; and Speiser, Peter, 4,329,332, Cl. 424-9.000.
Rollei-Werke Franke & Heidecke GmbH & Co.: *See—*
Rosner, Ortwin, 4,329,578, Cl. 250-201.000.
Rollins, Offord L., III; and Williams, Anthony F. Naso-gastric oxygen mask. 4,328,797, Cl. 128-202.270.
Rolls-Royce Limited: *See—*
Turner, Neville G., 4,329,175, Cl. 75-208.00R.
Ronold, Olav A., deceased: *See—*
Johansen, Aage M.; and Ronold, Olav A., deceased, 4,329,380, Cl. 427-236.000.
Roozenbeek, Herman: *See—*
Jundt, Werner; and Roozenbeek, Herman, 4,328,782, Cl. 123-609.000.
Rosa, Giovanni; and Scodino, Ambrogio, to Saipem S.p.A. Method for laying an underwater pipe to straddle an already laid pipe, and the relative devices. 4,329,086, Cl. 405-171.000.
Rosain, Claude; and Torossian, Alexandre, to Societe Francaise d'Applications Industrielles et Rurales d' Electricite (S.F.A.I.R.E.). Synchronous electric motor with very little rotor inertia and balanced conical motion. 4,329,607, Cl. 310-82.000.
Rosen, Melvin H., to Ciba-Geigy Corporation. 1-Benzothiepin-4-carboxyamides. 4,329,357, Cl. 424-275.000.
Rosner, Ortwin, to Rollei-Werke Franke & Heidecke GmbH & Co. Optical imaging system having variable focal length. 4,329,578, Cl. 250-201.000.
Ross, Cecil J., to W. R. Weaver Company. Clamp for mounting telescopic pistol sights. 4,328,624, Cl. 33-245.000.
Rossi, Pietro P.; and De Gaetano, Mario, to SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for preparing saturated ω-amino acids. 4,329,297, Cl. 260-404.000.
Rossow, Harold E.: *See—*
Lane, George A.; and Rossow, Harold E., 4,329,242, Cl. 252-70.000.
Rossville Yarn Processing Company: *See—*
Hutcheson, William F., 4,329,143, Cl. 8-483.000.
Roth, Claris D.; Moser, Kenneth B.; and Bomball, William A., to A. E. Staley Manufacturing Company. Method of using recycled mother liquors to produce aldosides. 4,329,449, Cl. 536-18.600.
Rothgery, Eugene F., to Olin Corporation. Selected poly(oxyalkylated) 1,3,4-thiadiazoles and their use as corrosion inhibitors. 4,329,475, Cl. 548-141.000.
Rough, J. Kirkwood H.: *See—*
Rigg, George P.; Cornsweet, Tom N.; Rough, J. Kirkwood H.; Ogle, H. Malcolm; Prunella, Wallace R.; and Schiller, Lawrence H., 4,329,049, Cl. 356-124.000.
Rousseau, Gerard; and Lamotte, Claude, to Rohm and Haas Company. Decationization of aqueous sugar solutions. 4,329,183, Cl. 127-46.200.
Rovee, David T.: *See—*
Nashed, Wilson; Rovee, David T.; and Gander, Robert J., 4,329,366, Cl. 424-324.000.
Roveyaz, Paul: *See—*
Capitini, Robert; and Roveyaz, Paul, 4,329,048, Cl. 356-73.000.
Rowland-Hill, E. William, to Sperry Corporation. Divider feed means for axial flow combine. 4,328,815, Cl. 130-27.00T.
Rubio, Charles A. Amine treatment for passivating sponge iron. 4,329,168, Cl. 75-0.5BA.
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, to Siemens Aktiengesellschaft. N-Azidosulfonylaryl-maleinimides. 4,329,556, Cl. 548-549.000.
Ruelle, Gilbert: *See—*
Allegre, Jean; Merouge, Gilbert; and Ruelle, Gilbert, 4,329,609, Cl. 310-183.000.
Russell, Robert G., to Owens-Corning Fiberglas Corporation. Method for forming and treating kinky fibers from glass. 4,329,163, Cl. 65-2.000.
Rust, Kurt; Brinkmann, Ludwig; and Lutz, Paul, to Hoechst Aktiengesellschaft. Process for the manufacture of a mixed catalyst. 4,329,256, Cl. 252-429.00B.
Ruth, William H.: *See—*
Ohmstedt, Harry O.; Ruth, William H.; and Krulls, Gerd E., 4,329,611, Cl. 310-227.000.
Rutt, Donald R.: *See—*
Spritzer, Lawrence; Stetter, Joseph R.; and Rutt, Donald R., 4,329,214, Cl. 204-195.00R.
Rutz, Peter, to Sulzer Brothers Ltd. Hydrostatic piston machine. 4,328,739, Cl. 91-484.000.
Ryan, Kenneth J.: *See—*
Henry, David W.; Ryan, Kenneth J.; and Grange, Edward W., 4,329,355, Cl. 424-272.000.
Ryczek, Lawrence J.; and Van Zeeland, Donald L., to Eaton Corporation. D.C. Switch circuit. 4,329,730, Cl. 361-100.000.
Ryder, Francis E.: *See—*
Thomas, Michael D.; and Ryder, Francis E., 4,328,890, Cl. 206-5.100.
Ryder International Corporation: *See—*
Thomas, Michael D.; and Ryder, Francis E., 4,328,890, Cl. 206-5.100.
Ryobi Limited: *See—*
Holahan, Joseph M.; Kobayashi, Takehiro; and Sazaki, Konin, 4,328,937, Cl. 242-218.000.
S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl G.; and Bergstrom, Per-Olof, 4,328,716, Cl. 74-760.000.
Saab-Scania Aktiebolag: *See—*
Hardmark, Ragnar M.; and Hanberger, Bror A. S., 4,328,622, Cl. 33-174.00P.
Sahara, Masayoshi; Kobori, Toshio; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Exposure control system for lens interchangeable cameras. 4,329,035, Cl. 354-37.000.
Saipem S.p.A.: *See—*
Rosa, Giovanni; and Scodino, Ambrogio, 4,329,086, Cl. 405-171.000.
Saito, Akira: *See—*
Yamori, Akio; Saito, Akira; and Morita, Hideo, 4,329,438, Cl. 525-64.000.
Saito, Mamoru: *See—*
Sugahara, Yujiro; Naito, Hiroyuki; Saito, Mamoru; and Tuchida, Hisashi, 4,329,182, Cl. 106-243.000.
Saito, Tutomu: *See—*
Mori, Masafumi; and Saito, Tutomu, 4,329,011, Cl. 350-6.600.
Saiveau, Gerald: *See—*
Langer, Herbert; and Saiveau, Gerald, 4,329,308, Cl. 264-162.000.

Sakaguchi, Hiroo: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,329,673, Cl. 335-288.000.

Sakamoto, Shigetoshi; and Suzuki, Nobuya, to Hoshizaki Electric Co., Ltd. Electric refrigerator with an automatic ice-making unit. 4,328,681, Cl. 62-157.000.

Sakane, Toshio: *See*—
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,329,033, Cl. 354-25.000.

Sakasai, Toshio: *See*—
Noda, Fumio; Hayashi, Kazuya; Mogi, Keitaro; Iwaasa, Takashi; Mizunuma, Takeji; and Sakasai, Toshio, 4,329,370, Cl. 426-46.000.

Sakurai, Junji; and Miyasaka, Kiyoshi, to Fujitsu Limited. MOS Random access memory with buried storage capacitor. 4,329,704, Cl. 357-41.000.

Salzmann, Gerhard: *See*—
Machmerth, Herbert; Mann, Georg; and Salzmann, Gerhard, 4,328,711, Cl. 74-194.000.

Samowich, Joseph J. Decorative laminate. 4,329,386, Cl. 428-196.000.

Sampei, Tetsuya: *See*—
Ouchi, Chiaki; and Sampei, Tetsuya, 4,329,172, Cl. 75-124.000.

Sanada, Kokichi, to Fuji Seiko Kabushiki Kaisha. Ribbon switching device for a portable typewriter. 4,329,074, Cl. 400-216.500.

Sanders, Glen D. Adjustable skating shoe. 4,328,627, Cl. 36-115.000.

Sandoz, Inc.: *See*—
Damon, Robert E., II; and Nadelson, Jeffrey, 4,329,349, Cl. 424-256.000.

Sandoz Ltd.: *See*—
Danner, Bernard, 4,329,390, Cl. 428-264.000.
Ringwald, Erwin, 4,329,354, Cl. 424-270.000.

Sangamo Weston, Inc.: *See*—
Wilder, Joseph, 4,329,060, Cl. 356-375.000.

Sano, Hiroshi: *See*—
Shono, Kanji; Kitoh, Tokio; Sano, Hiroshi; and Hironaka, Takashi, 4,329,154, Cl. 23-301.000.

Sanofi: *See*—
Bernhart, Claude; Gagnol, Jean P.; and Gautier, Patrick, 4,329,343, Cl. 424-248.540.

Sarkanen, Kyosti V., to Board of Reagents, University of Washington. Method and system for selective alkaline defiberization and delignification. 4,329,200, Cl. 162-77.000.

Sarot, Pierre: *See*—
Brichard, Jean; Colery, Jean-Claude; and Sarot, Pierre, 4,329,244, Cl. 252-99.000.

Sasaki, Kunio: *See*—
Tarumi, Niro; Tsuchiya, Makoto; and Sasaki, Kunio, 4,329,378, Cl. 427-157.000.

Sasaya, Hideaki: *See*—
Kikuchi, Tetsuro; Sasaya, Hideaki; and Ishihara, Yasumasa, 4,329,047, Cl. 356-28.000.

Sato, Atushi; Shimizu, Isoo; Endo, Keizi; and Yanagishita, Hitoshi, to Nippon Petrochemical Company, Ltd. Oil-impregnated power cable. 4,329,536, Cl. 174-25.00C.

Sato, Tsutomu: *See*—
Tanikawa, Kiyoshi; Yoshikawa, Masao; and Sato, Tsutomu, 4,329,416, Cl. 430-133.000.

Sato, Yoshinori: *See*—
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,329,369, Cl. 426-3.000.

Satoh, Masatoshi, to Kioritz Corporation. Safety brake mechanism for power chain saws. 4,328,617, Cl. 30-382.000.

Satterwhite, Charles R., to Unit Rig & Equipment Co. Excavating and pipeline installation system. 4,329,087, Cl. 405-179.000.

Sauer, Joseph J., to Boeing Company, The. Multiple spindle flexible sanding head. 4,328,645, Cl. 51-170.00T.

Saunders, Peter R.; and Biron, Raymond J., to Allied Chemical Corporation. Method of preparation of fluorocarbon compounds. 4,329,489, Cl. 560-79.000.

Savin Corporation: *See*—
Landa, Benzion, 4,329,070, Cl. 400-118.000.

Sawada, Daisaku: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,328,779, Cl. 123-416.000.

Sawada, Yoshio: *See*—
Aoki, Harumi; and Sawada, Yoshio, 4,329,032, Cl. 354-25.000.

Sawyer, Philip N.; and Freeman, Leon D. Antithrombotic derivatives of ammonium ascorbate. 4,329,290, Cl. 549-316.000.

Sazaki, Konin: *See*—
Holahan, Joseph M.; Kobayashi, Takehiro; and Sazaki, Konin, 4,328,937, Cl. 242-218.000.

SCA Development Aktiebolag: *See*—
Andersson, Per-Erik; and Eriksson, Fall E. I., 4,329,199, Cl. 162-19.000.

Schaefer, Fritz-Peter; and Jasny, Jan, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Interferometer apparatus for measuring the wavelengths of optical radiation. 4,329,055, Cl. 356-346.000.

Schafer, Robert H., to UTI Corporation. Coaxial cable low frequency band-pass filter. 4,329,667, Cl. 333-206.000.

Schafer, Rolf; and Singh, Sumanjit, to Eichhorn, Friedrich. Method of ensuring the maintenance of constant quality of spot welds. 4,329,561, Cl. 219-110.000.

Scheffel, Walter. Apparatus for weft insertion in a weaving loom. 4,328,842, Cl. 139-435.000.

Scheithauer, Richard A.: *See*—
Gingerich, Richard G. W.; and Scheithauer, Richard A., 4,329,169, Cl. 75-0.5AA.

Schelhorn, Robert L., to RCA Corporation. Method for the manufacture of porcelain coated metal boards having interconnections between the top and bottom surfaces. 4,328,614, Cl. 29-842.000.

Scherbing, Frank J., to Fort Lock Corporation. Alarm switch mechanism for axial pin tumbler locks. 4,328,691, Cl. 70-363.000.

Schering Corporation: *See*—
Neri, Rudolph O.; and Topliss, John G., 4,329,364, Cl. 424-324.000.

Schildmann, Jens A.: *See*—
Seebeck, Dietrich; Schildmann, Jens A.; Weisrock, Reinhard; and Koch, Julius, 4,329,433, Cl. 435-255.000.

Schiller, Lawrence H.: *See*—
Rigg, George P.; Cornsweet, Tom N.; Rough, J. Kirkwood H.; Ogle, H. Malcolm; Prunella, Wallace R.; and Schiller, Lawrence H., 4,329,049, Cl. 356-124.000.

Schiwy, Willy: *See*—
Koll, Jochen; Molls, Hans-Heinz; Hornle, Reinhold; Schuffenhauer, Erhard; Brandt, Horst; Bremer, Fritz; Wolf, Karlheinz; and Schiwy, Willy, 4,329,145, Cl. 8-527.000.

Schlegel Corporation: *See*—
Elley, John E., 4,329,080, Cl. 404-74.000.

Schlegel, Rainer, to Hoechst Aktiengesellschaft. Process for the purification of waste sulfuric acid containing fluoride. 4,329,155, Cl. 23-306.000.

Schlumberger Technology Corporation: *See*—
Gringarten, Alain C., 4,328,705, Cl. 73-155.000.

Schmid, Peter, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Manipulating device, particularly for industrial robots. 4,329,110, Cl. 414-730.000.

Schmid, Peter, to Societe Suisse pour l'Industrie Horlogere Management Services. Mechanical manipulator. 4,329,111, Cl. 414-733.000.

Schmidt, Adolf: *See*—
Heinz, Werner; Schmidt, Adolf; and Jambor, Arno, 4,329,738, Cl. 362-61.000.

Schmidt, Donald L.: *See*—
Doorakian, George A.; and Schmidt, Donald L., 4,329,480, Cl. 549-78.000.

Schmitt, Alfons: *See*—
Voelker, Wolfgang; Schmitt, Alfons; and Radeck, Fritz, 4,329,377, Cl. 427-9.000.

Schmitt, Frederick L.: *See*—
Klemarczyk, Philip T.; Schmitt, Frederick L.; Granda, Edward J.; and Luccarelli, Domenick, Jr., 4,329,373, Cl. 426-538.000.

Schmuck, Peter, to Hilti Aktiengesellschaft. Position indicator for a manually operated apparatus. 4,329,095, Cl. 408-112.000.

Schneider, Fred, Jr.: *See*—
Bonsack, James P.; and Schneider, Fred, Jr., 4,329,322, Cl. 423-74.000.

Schneider, Georg: *See*—
Kilian, Eberhard; and Schneider, Georg, 4,329,164, Cl. 65-21.200.

Schnell, William J.: *See*—
Bodnar, Bert S.; and Schnell, William J., 4,329,229, Cl. 210-321.200.

Schnettler, Richard A.: *See*—
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,329,470, Cl. 546-210.000.
Grisar, J. Martin; Schnettler, Richard A.; and Dage, Richard C., 4,329,471, Cl. 546-210.000.

Schoenmakers, Johannes J. M., to U.S. Philips Corporation. Adjustable mounting for a magnetic tape head. 4,329,723, Cl. 360-109.000.

Schoonover, David J.; and Larson, Paul, to Hach Chemical Company. Method for spectrophotometric compensation for colorimetric reagent variation. 4,329,149, Cl. 23-230.00R.

Schramm, Peter, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Arrangement for metering ink on the fountain roller of a printing press. 4,328,748, Cl. 101-365.000.

Schramm, Wayne E. Electronic audio visual torque indicator adapter. 4,328,709, Cl. 73-862.230.

Schreiber, Peter J., to N.A.D. Inc. Oxygen flow ratio controller for anesthesia apparatus. 4,328,823, Cl. 137-88.000.

Schubart, Rudiger; and Langner, Gunter P., to Bayer AG. Process for the production of 4- or 5-methyl-2-mercaptobenzimidazole. 4,329,477, Cl. 548-305.000.

Schubert, Warren R.: *See*—
Su, Dean T.; and Schubert, Warren R., 4,329,334, Cl. 424-70.000.
Su, Dean T.; and Schubert, Warren R., 4,329,335, Cl. 424-70.000.
Su, Dean T.; and Schubert, Warren R., 4,329,336, Cl. 424-70.000.

Schuffenhauer, Erhard: *See*—
Koll, Jochen; Molls, Hans-Heinz; Hornle, Reinhold; Schuffenhauer, Erhard; Brandt, Horst; Bremer, Fritz; Wolf, Karlheinz; and Schiwy, Willy, 4,329,145, Cl. 8-527.000.

Schummer, Anton; Hansen, Uwe-Jens; and Kopke, Michael, to Norddeutsche Affinerie. Method of treating sulfur-containing metallurgical materials. 4,329,170, Cl. 75-23.000.

Schuster, Karl: *See*—
Hillenbrand, Bernhard; Mai, Herbert; and Schuster, Karl, 4,329,626, Cl. 315-169.400.

SCM Corporation: *See*—
Bonsack, James P.; and Schneider, Fred, Jr., 4,329,322, Cl. 423-74.000.
Ho, T. L.; and Liu, Shing-Hou, 4,329,508, Cl. 568-361.000.
McDonough, Robert M.; Hanson, Thomas E.; Brill, Richard H.; and Oates, Ronald W., 4,328,740, Cl. 99-295.000.

Oates, Ronald W., Sr.; and Fagan, John C., 4,328,834, Cl. 137-636.100.
Scoates, Kenneth D., to Gibbs & Hill, Inc. Ion sensor probe. 4,329,649, Cl. 324-438.000.
Scodino, Ambrogio: *See*—
Rosa, Giovanni; and Scodino, Ambrogio, 4,329,086, Cl. 405-171.000.
Scott, Larkin B.: *See*—
Chamran, Morteza M.; Scott, Larkin B.; and Williams, Paul B., 4,329,051, Cl. 356-320.000.
Scott Paper Company: *See*—
Gordon-Clark, Matthew R.; Bullock, Richard H. D., Jr.; and Fogle, H. William, Jr., 4,328,931, Cl. 242-67.500.
Scott, Roger P.; and Kahle, W. Wayne, to Philips Industries, Inc. Plastic clad window and method of manufacture. 4,328,644, Cl. 49-501.000.
Scoville, Frank. Sodium hypochorite production and storage system. 4,329,215, Cl. 204-229.000.
Scripto, Inc.: *See*—
Muller, Frank A., 4,329,262, Cl. 523-161.000.
Muller, Frank A., 4,329,264, Cl. 523-162.000.
Scrivo, Jerry V.: *See*—
Weller, Peter A.; and Scrivo, Jerry V., 4,328,986, Cl. 293-120.000.
Scurlock, Scot L.: *See*—
Lyons, William C.; and Scurlock, Scot L., 4,328,839, Cl. 138-120.000.
Seaquist Valve Company: *See*—
Knickerbocker, Michael G., 4,328,911, Cl. 222-182.000.
Seebeck, Dietrich; Schildmann, Jens A.; Weisrock, Reinhard; and Koch, Julius, to Eckes, Peter. Process for continuous fermentation. 4,329,433, Cl. 435-255.000.
Seiko Koki Kabushiki Kaisha: *See*—
Nakagawa, Tadashi, 4,329,038, Cl. 354-195.000.
Seki, Nagataka: *See*—
Higa, Osamu; and Seki, Nagataka, 4,329,652, Cl. 328-72.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Device for feeding cigarettes in bulk to the hopper of a packaging machine. 4,328,886, Cl. 198-347.000.
Serur, Juan R. Constant-flow regulator for gravity-fed liquids. 4,328,820, Cl. 137-2.000.
Seven-H Corporation: *See*—
Hart, Edwin R., 4,329,371, Cl. 426-461.000.
Sexton, Thomas J., to United States of America, Agriculture. Turkey semen extender. 4,329,337, Cl. 424-105.000.
Seyerle, Carl E., to Outboard Marine Corporation. Riding mower including belt drive system. 4,328,659, Cl. 56-11.800.
Shanks, Roy R.: *See*—
Mahon, Michael J.; and Shanks, Roy R., 4,329,685, Cl. 340-825.840.
Shapiro, Leonard, to Pennwalt Corporation. Hard surfacing for a centrifuge conveyor. 4,328,925, Cl. 233-7.000.
Sharp Kabushiki Kaisha: *See*—
Aiba, Masahiko, 4,329,695, Cl. 346-75.000.
Shaw, Douglas R.: *See*—
Ramadorai, Gopalan; and Shaw, Douglas R., 4,329,223, Cl. 209-167.000.
Shaw, Pern, to Motorola, Inc. High-speed voltage subtractor. 4,329,656, Cl. 330-257.000.
Shaw, Robert C.: *See*—
Cymbalisty, Lubomyr M. O.; and Shaw, Robert C., 4,328,710, Cl. 73-863.860.
Sheets, John H. Intraocular lens. 4,328,595, Cl. 3-13.000.
Shell Oil Company: *See*—
Conn, Paul J.; and Post, Martin F. M., 4,329,532, Cl. 585-407.000.
Goodall, Brian L.; Van der Nat, Adrianus A.; and Sjardijn, Willem, 4,329,253, Cl. 252-429.00B.
van Aken, Andreas B.; Blytas, George C.; and Visser, Rene M., 4,329,233, Cl. 210-673.000.
van der Weijst, Ludovicus B. J. O.; De Vries, Enno B.; and Heiszwolf, Gerard J., 4,329,514, Cl. 568-577.000.
Shellhause, Ronald L., to General Motors Corporation. Hydraulic actuator mechanism for a friction clutch. 4,328,883, Cl. 192-85.0CA.
Shelton, Kent: *See*—
Gilliette, Robert H.; Brammall, Terrence N.; Shelton, Kent; and Cramer, Chris, 4,328,647, Cl. 51-338.000.
Sherman, John D.; and Katsaros, Arthur T., to Union Carbide Corporation. Suppression of COS formation in molecular sieve purification of hydrocarbon gas streams. 4,329,160, Cl. 55-62.000.
Sherman, Paul D., Jr.: *See*—
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,329,520, Cl. 568-896.000.
Sherritt Gordon Mines Limited: *See*—
Vydra, Charles; and Parekh, Bhupendra M., 4,329,320, Cl. 423-1.000.
Shibata, Masaki: *See*—
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, 4,329,369, Cl. 426-3.000.
Shibata, Noriyoshi: *See*—
Kawabata, Yasuhiro; and Shibata, Noriyoshi, 4,329,123, Cl. 417-393.000.
Shiel, Walter P. Socket wrench and set. 4,328,720, Cl. 81-63.000.
Shih, Howard H.: *See*—
Faber, Paul V.; and Shih, Howard H., 4,329,203, Cl. 202-135.000.
Shimadzu, Hiroshi: *See*—
Miyashita, Osamu; Matsumura, Koichi; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,329,460, Cl. 544-301.000.
Shimano Industrial Company Limited: *See*—
Isobe, Mitsuhide, 4,328,882, Cl. 192-64.000.
Shimatani, Kazuo. Hygienic tampon and tampon applicator. 4,328,804, Cl. 128-285.000.
Shimizu, Hirokazu: *See*—
Sugino, Takashi; Ito, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,329,661, Cl. 372-46.000.
Shimizu, Isoo: *See*—
Sato, Atushi; Shimizu, Isoo; Endo, Keizi; and Yanagishita, Hitoshi, 4,329,536, Cl. 174-25.00C.
Shimizu, Mituo; and Miyake, Hidenori, to Kabushiki Kaisha Yamashina Seikosho. Self-drilling and self-extruding fastener. 4,329,099, Cl. 411-412.000.
Shimizu, Taketo: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,329,673, Cl. 335-288.000.
Shimizu, Toshio: *See*—
Ozawa, Masaru; Ooba, Yuji; and Shimizu, Toshio, 4,328,977, Cl. 282-27.500.
Shimogawa, Toshiaki: *See*—
Tsuge, Noboru; Kuwakado, Satosi; and Shimogawa, Toshiaki, 4,328,976, Cl. 280-806.000.
Shimoi, Masahiro: *See*—
Takashina, Naomitsu; Shimoi, Masahiro; and Iwamoto, Yoshinori, 4,329,269, Cl. 525-366.000.
Shinkai, Ichiro: *See*—
Liu, Thomas M. H.; Reamer, Robert A.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,329,481, Cl. 556-410.000.
Shinoda, Nobuhiko: *See*—
Murakami, Hiroyasu; Uchidoi, Masanori; Yamamichi, Masayoshi; Shinoda, Nobuhiko; Suzuki, Masayuki; and Ito, Tadashi, 4,329,034, Cl. 354-37.000.
Shinoda, Yoshio: *See*—
Kuno, Akira; Matsui, Takeshi; and Shinoda, Yoshio, 4,328,776, Cl. 123-352.000.
Shinozaki, Tadashi; Hashimoto, Takashi; and Yamazaki, Shigeyuki, to Hitachi, Ltd. Combustion apparatus. 4,329,139, Cl. 431-350.000.
Shinshu Seiki Kabushiki Kaisha: *See*—
Fujiwara, Hitoshi; and Kawabata, Yousei, 4,328,747, Cl. 101-93.170.
Shiozaki, Ken; and Ibaraki, Hironobu, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for removing ethylene and vinyl chloride from gas stream. 4,329,323, Cl. 423-240.000.
Shono, Kanji; Kitoh, Tokio; Sano, Hiroshi; and Hironaka, Takashi, to Mitsubishi Chemical Industries, Limited. Method of recovering boric acid. 4,329,154, Cl. 23-301.000.
Shores, Marvin W., to General Dynamics, Pomona Division. Solar heat collector. 4,328,792, Cl. 126-438.000.
Shroff, James R.; and Desai, Rohit, to USV Pharmaceutical Corporation. N-(2-Pyrimidinyl)-4-aryl-4-[N'-(alkylamino alkyl)]-piperidinamide. 4,329,345, Cl. 424-251.000.
Sieloff, Ronald A.: *See*—
Gonwa, Charles J.; Baker, Kenneth L.; and Sieloff, Ronald A., 4,328,696, Cl. 72-389.000.
Siemens Aktiengesellschaft: *See*—
Adelmeyer, Dieter, 4,329,590, Cl. 250-511.000.
Brunner, Anton, 4,329,692, Cl. 343-780.000.
Hillenbrand, Bernhard; Mai, Herbert; and Schuster, Karl, 4,329,626, Cl. 315-169.400.
Kinzel, Hermann; and Katsch, Peter, 4,329,613, Cl. 310-344.000.
Littwin, Burkhard, 4,329,617, Cl. 313-268.000.
Meyer, Hartmut, 4,329,538, Cl. 174-119.00R.
Offermanns, Walter, 4,329,653, Cl. 328-155.000.
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, 4,329,556, Cl. 548-549.000.
Vogelsberg, Dieter; and Koch, Klaus, 4,328,664, Cl. 57-293.000.
Welzhofer, Klaus, 4,329,728, Cl. 361-91.000.
Westermayer, Jorg, 4,329,545, Cl. 178-22.030.
Wild, Alfred, 4,329,542, Cl. 178-69.00R.
Siemens Medical Laboratories, Inc.: *See*—
Chamberlain, Jerry E., 4,329,654, Cl. 328-233.000.
Sieve, Gregor, to Gebr. Poppelmann, Inhabber Josef Poppelmann. Device for mounting plastic sheets. 4,328,649, Cl. 52-202.000.
Signode Corporation: *See*—
Trimble, Roy L., 4,328,745, Cl. 101-7.000.
Siliconix, Incorporated: *See*—
Luthi, Robert B.; and Williams, Clair E., 4,329,642, Cl. 324-158.00F.
Silver, Robert H. Method and apparatus for the chemical treatment of plants. 4,328,821, Cl. 137-7.000.
Simmons, Neil J. Grapevine suckering tool. 4,328,660, Cl. 56-12.700.
Simpson, Daniel W.: *See*—
Davis, Stephen H.; and Simpson, Daniel W., 4,329,225, Cl. 210-96.100.
Simpson, George R.: *See*—
Rees, James D.; Simpson, George R.; and Bliek, David C., 4,329,045, Cl. 355-67.000.
Singer, Gunter: *See*—
Mack, Heinz; and Singer, Gunter, 4,328,620, Cl. 33-174.00D.
Singh, Prithipal; and Pirio, Marcel R., to Syva Company. Propranolol antigen conjugates and antibodies. 4,329,502, Cl. 564-349.000.
Singh, Sumanjit: *See*—
Schafer, Rolf; and Singh, Sumanjit, 4,329,561, Cl. 219-110.000.
Sircar, Shivaji, to Air Products and Chemicals, Inc. Air fractionation by pressure swing adsorption. 4,329,158, Cl. 55-26.000.

Sittardt, Hans-Gunter; and Radke, Matthias, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for extracting pulverous or granular material. 4,329,319, Cl. 422-224.000.
Sixt, Karl: *See*—
Gartner, Jurij; Hengl, Helmut; Sixt, Karl; and Woltmann, Reinhard, 4,328,854, Cl. 164-369.000.
Sjardijn, Willem: *See*—
Goodall, Brian L.; Van der Nat, Adrianus A.; and Sjardijn, Willem, 4,329,253, Cl. 252-429.00B.
SKF Kugellagerfabriken GmbH: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., 4,328,999, Cl. 308-6.00C.
Skinner, Ronald W.: *See*—
Dalton, Augustine L., Jr.; and Skinner, Ronald W., 4,329,321, Cl. 423-22.000.
SKW Trostberg Aktiengesellschaft: *See*—
Vollbrecht, Heinz-Rudiger; and Wagner, Fritz, 4,329,325, Cl. 423-267.000.
Sletzinger, Meyer: *See*—
Liu, Thomas M. H.; Reamer, Robert A.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,329,481, Cl. 556-410.000.
Smith, Arthur R.; and Harris, Denis J., to Wildt Mellor Bromley Limited. Knitting machines having improved yarn supply arrangements. 4,328,685, Cl. 66-125.00R.
Smith, David G.: *See*—
Ainsworth, Anthony T.; and Smith, David G., 4,329,358, Cl. 424-309.000.
Smith, George H.: *See*—
Melvold, Robert W.; Vrolyk, John J.; and Smith, George H., 4,329,132, Cl. 425-13.000.
Smith International, Inc.: *See*—
Morrill, Charles D.; Des Lierres, John M.; and Copeland, Louis E., 4,329,085, Cl. 405-169.000.
Tschirky, John E.; and Geczy, Bela A., 4,329,127, Cl. 418-48.000.
Smith, Lindel F. Wire rope spare tire carrier. 4,329,107, Cl. 414-463.000.
Smith, Normand C., to International Business Machines Corporation. Disposable cartridge for ink drop printer. 4,329,698, Cl. 346-140.00R.
Smith, Walter E. Slide bar holder device for Hawaiian guitar. 4,328,733, Cl. 84-319.000.
Smithkline Instruments, Inc.: *See*—
Detweiler, Michael B.; Lawrence, Paul J.; and Townsley, Charles W., 4,329,317, Cl. 422-58.000.
Smithson, James A., to Illinois Power Company. Method of eliminating mussels and the like from an underwater bed. 4,328,638, Cl. 43-124.000.
Snell, Darrell E.: *See*—
Crowe, William D.; and Snell, Darrell E., 4,329,228, Cl. 210-230.000.
SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Rossi, Pietro P.; and De Gaetano, Mario, 4,329,297, Cl. 260-404.000.
Snook, Martin; Rideout, James M.; and Renshaw, Alan, to National Research Development Corporation. Turntable device for analyzing chemical substances. 4,329,061, Cl. 356-414.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Grassi, Francesco, 4,328,898, Cl. 211-41.000.
Montesi, Vittorio; and Besi, Mario, 4,329,546, Cl. 179-81.00R.
Societe Anonyme dite: Les Cables de Lyon: *See*—
Dubost, Rene, 4,329,018, Cl. 350-96.230.
Societe Anonyme dite: Visiodis: *See*—
Van Hulle, Erick, 4,329,675, Cl. 358-86.000.
Societe Anonyme Francaise Du Ferodo: *See*—
Bouvot, Jean-Francois, 4,328,859, Cl. 165-78.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Invernizzi, Rutillio; and Prella, Giovanni, 4,329,374, Cl. 426-582.000.
Societe Francaise d'Applications Industrielles et Rurales d' Electricite (S.F.A.I.R.E.): *See*—
Rosain, Claude; and Torossian, Alexandre, 4,329,607, Cl. 310-82.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Ayache, Michel R.; Glowacki, Pierre A.; and Mandet, Gerard M. F., 4,329,113, Cl. 415-116.000.
Langer, Herbert; and Saiveau, Gerald, 4,329,308, Cl. 264-162.000.
Societe Nationale Elf Aquitaine: *See*—
Foure, Michel, 4,329,279, Cl. 524-180.000.
Societe Probio DMS: *See*—
Mau-Tung, Do; and Lam, Do M., 4,328,701, Cl. 73-59.000.
Societe Soletanche: *See*—
Parkinson, Jonathan J., 4,329,083, Cl. 405-154.000.
Societe Suisse pour l'Industrie Horlogere Management Services: *See*—
Schmid, Peter, 4,329,111, Cl. 414-733.000.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See*—
Mai, Tu X., 4,329,601, Cl. 310-49.00R.
Schmid, Peter, 4,329,110, Cl. 414-730.000.
Sohnle, Rudiger: *See*—
Hagenlocher, Walter; Hesse, Heinz; Sohnle, Rudiger; Kleebaur, Karl; and Kugel, Christoph, 4,329,608, Cl. 310-91.000.
Solar Development Inc.: *See*—
Cartland, William H., 4,329,206, Cl. 202-177.000.
Solender, Peter E.: *See*—
Eglowstein, Ira; and Solender, Peter E., 4,328,746, Cl. 101-72.000.
Sollott, Gilbert P.: *See*—
Gilbert, Everett E.; and Sollott, Gilbert P., 4,329,522, Cl. 568-941.000.
Sommer, August; Heitmann, Wilhelm; and Brucker, Rainer, to Chemische Werke Huls Aktiengesellschaft. Method of producing a catalyst from clay minerals for the hydration of olefins. 4,329,257, Cl. 252-435.000.
Sommerkamp, Peter; and Heil, Walter, to Leybold-Heraeus. Vaporizer for vacuum deposition installations. 4,328,763, Cl. 118-727.000.
Sony Corporation: *See*—
Imai, Tsutomu, 4,329,547, Cl. 179-111.00E.
Ninomiya, Ichiro, 4,329,719, Cl. 360-14.000.
Yamamoto, Kaichi; and Yoshimoto, Kazuo, 4,329,708, Cl. 358-36.000.
Sorenson, Marius W.; Ezzell, Bobby R.; and Pimlott, John R., to Dow Chemical Company, The. Vertical cathode pocket assembly for membrane-type electrolytic cell. 4,329,218, Cl. 204-283.000.
Southwest Utilities, Inc.: *See*—
Danford, Glenn S., 4,329,543, Cl. 179-1.0HF.
Souza, Ronald; and Dunne, Owen F., to Clevepak Corporation. Thread end holder for sewing machine. 4,328,758, Cl. 112-286.000.
Souzu, Isao: *See*—
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,329,455, Cl. 544-89.000.
Sovey, James S.: *See*—
Banks, Bruce A.; Weigand, Albert J.; and Sovey, James S., 4,329,385, Cl. 428-141.000.
Sparrell, Patricia T.: *See*—
Vogt, Frederick G., deceased: and Sparrell, Patricia T., 4,329,250, Cl. 252-389.00R.
Spectron Development Laboratories, Inc.: *See*—
Bachalo, William D., 4,329,054, Cl. 356-336.000.
Speier, John L., to Dow Corning Corporation. Preparation of cyclotetrasiloxanes aliphatic chlorides and acyl chlorides. 4,329,483, Cl. 556-436.000.
Speiser, Peter: *See*—
Couvreur, Patrick; Roland, Michel; and Speiser, Peter, 4,329,332, Cl. 424-9.000.
Speizman Industries, Inc.: *See*—
Barbee, Jack C.; and Hart, Gene E., 4,328,686, Cl. 66-224.000.
Spencer, Harvey J.; and Niedermeyer, William P., to Paper Converting Machine Company. Method of manufacturing a packaged web product and apparatus therefor. 4,328,655, Cl. 53-439.000.
Sperry Corporation: *See*—
Aspinwall, Ronald A., 4,328,950, Cl. 251-297.000.
Green, Allen P.; and Grey, Donald M., 4,329,101, Cl. 414-24.500.
Lee, Patrick S.; and Cuda, John, 4,329,721, Cl. 360-78.000.
Matthews, Hugh B., 4,328,673, Cl. 60-641.400.
Rowland-Hill, E. William, 4,328,815, Cl. 130-27.00T.
Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries, Inc. Instrument actuation assembly. 4,328,714, Cl. 74-501.00R.
Sportoletti, Giancarlo, to Italfarmaco S.p.A. Pharmaceutical composition having antiphlogistic, antipyretic and analgesic activity. 4,329,340, Cl. 424-232.000.
Sprecher & Schuh AG: *See*—
Graf, Rudolf, 4,329,553, Cl. 200-148.00A.
Springer, Edward L., to United States of America, Agriculture. Process for preservation of stored wood chips. 4,329,368, Cl. 424-334.000.
Springthorpe, Anthony J.: *See*—
Noad, Julian P.; Springthorpe, Anthony J.; and Look, Christopher M., 4,329,189, Cl. 148-171.000.
Spritzer, Lawrence; Stetter, Joseph R.; and Rutt, Donald R., to Becton, Dickinson and Company. Gas detection unit. 4,329,214, Cl. 204-195.00R.
SPS Technologies, Inc.: *See*—
Gluskin, Richard S., 4,328,871, Cl. 173-12.000.
Square D Company: *See*—
Hart, Robert E., 4,329,725, Cl. 361-18.000.
Staab, Robert A.: *See*—
Gilbert, Lawrence A.; Staab, Robert A.; Collins, Royal D.; and Ries, Charles R., 4,329,246, Cl. 252-103.000.
Staalkat B.V.: *See*—
Temming, Leonardus J., 4,328,908, Cl. 221-213.000.
Staats, James E., to General Electric Company. Microwave oven with improved energy distribution. 4,329,557, Cl. 219-10.55F.
Stahl, Heinz; and Wagner, Harald, to Elektro-Mechanik GmbH. Polarized electromagnetic drive for a limited operating range of a control element. 4,329,672, Cl. 335-229.000.
Stahly, Tim S., to University of Kentucky Research Foundation. Method for improving the metabolic stability and survival of newborn pigs. 4,329,359, Cl. 424-312.000.
Stamp, Custis L., Jr.; and Herzog, Rollie R., to General Electric Company. Heat pump defrost control apparatus. 4,328,680, Cl. 62-155.000.
Standard Oil Company, The: *See*—
Alford, Harvey E.; and Chan, Keng S., 4,329,236, Cl. 252-8.55D.
Talsma, Herbert; and Giffen, William M., Jr., 4,329,401, Cl. 428-462.000.
Velenyi, Louis J.; and Krupa, Andrew S., 4,329,506, Cl. 568-310.000.
Standard Oil Company (Indiana): *See*—
Berry, Kay L., 4,328,863, Cl. 166-261.000.
Standiford, Ferris C. Apparatus for forced circulation evaporation. 4,329,198, Cl. 159-6.00R.
Stanier, Colin: *See*—
Byrd, Geoffrey C. M.; and Stanier, Colin, 4,329,217, Cl. 204-252.000.

Stanton, David B.: *See*—
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,329,520, Cl. 568-896.000.

Stark, Friedrich: *See*—
Reimpell, Uwe; Grein, Lutz; Reiter, Reinhard; and Stark, Friedrich, 4,328,947, Cl. 251-80.000.

Stauffer Chemical Company: *See*—
Turczyk, Michael J., 4,329,310, Cl. 264-211.000.

Steel, Frank B., to Minnesota Mining and Manufacturing Company. Flexible magnetic recording tape having low-friction backside coating. 4,328,935, Cl. 242-192.000.

Steele, Robert D.; and Doll, Duane E., to Allis-Chalmers Corporation. Adjustable positive means for locking studs and nuts having critical prestress value. 4,329,097, Cl. 411-88.000.

Steer, David C.: *See*—
Cox, Roger B.; and Steer, David C., 4,329,448, Cl. 536-123.000.

Steffen, Ulrich: *See*—
Riebel, Klaus; Alberts, Heinrich; Bartl, Herbert; Mietzsch, Fritz; and Steffen, Ulrich, 4,329,267, Cl. 523-323.000.

Stetter, Joseph R.: *See*—
Spritzer, Lawrence; Stetter, Joseph R.; and Rutt, Donald R., 4,329,214, Cl. 204-195.00R.

Stewart, Duncan: *See*—
Valentian, Dominique R.; Bartoli, Cesare M.; Pfeffer, Heinrich A.; Herhudt v. Rohden, Hans-Joachim; and Stewart, Duncan, 4,328,667, Cl. 60-202.000.

Stewart, Roger G., to RCA Corporation. Overload protection circuit for output driver. 4,329,600, Cl. 307-540.000.

Stievenart, Emile F.; Plessers, Hendrik S.; Hellemans, Julianus J.; and Neujens, Georges J., to AGFA-GEVAERT N.V. Device for positioning radiographic cassettes. 4,329,589, Cl. 250-468.000.

Stirling, William L.: *See*—
Dagenhart, William K.; and Stirling, William L., 4,329,586, Cl. 250-426.000.

Stokbroekx, Raymond A.; Willems, Joannes J. M.; and Luyckx, Marcel G. M., to Janssen Pharmaceutica, N.V. 1-(4-Aryl-cyclohexyl)piperidine derivatives, method of use thereof and pharmaceutical compositions thereof. 4,329,353, Cl. 424-267.000.

Stoll, Kurt. Universal module for pneumatic fixed-cycle control. 4,328,829, Cl. 137-624.110.

Stoll, Kurt. Adaptor connecting piece for conduits designed to carry gaseous or liquid media. 4,328,979, Cl. 285-174.000.

Stone, James H.; and Stone, Stephen H., to Dunlop Limited. Dartboard. 4,328,971, Cl. 273-408.000.

Stone, Stephen H.: *See*—
Stone, James H.; and Stone, Stephen H., 4,328,971, Cl. 273-408.000.

Stoukides, Michael: *See*—
Vayenas, Costas G.; and Stoukides, Michael, 4,329,208, Cl. 204-59.00R.

Strahan, Virgil H.: *See*—
James, Kenneth A.; Quick, William H.; and Strahan, Virgil H., 4,329,058, Cl. 356-352.000.

Strangio, Vincent: *See*—
Riegel, Herbert; Strangio, Vincent; and Sze, Morgan C., 4,329,525, Cl. 570-191.000.

Strassburg, Jack W. Telephone sterilizer apparatus. 4,329,548, Cl. 179-185.000.

Straumann, Fritz: *See*—
Sutter, Franz; and Straumann, Fritz, 4,328,593, Cl. 3-1.910.

Stuck, Jochen-Wilfried: *See*—
Hansen, Guenter; Kermer, Wolf-Dieter; and Stuck, Jochen-Wilfried, 4,329,148, Cl. 8-639.000.

Studiengesellschaft Kohle mbH: *See*—
Bogdanovic, Borislav, 4,329,301, Cl. 260-665.00R.

Sturm, Elmar: *See*—
Heeres, Jan; Backx, Leo; Van Laerhoven, Willy; and Sturm, Elmar, 4,329,342, Cl. 424-245.000.

Stuwe, Arnd: *See*—
Klauke, Erich; Kysela, Ernst; Stuwe, Arnd; and Dorlars, Alfons, 4,329,458, Cl. 544-217.000.

Styles, Virgil L.: *See*—
Morrison, Robert W., Jr.; Mallory, William R.; and Styles, Virgil L., 4,329,362, Cl. 424-320.000.

Su, Dean T.; and Schubert, Warren R., to Colgate-Palmolive Company. Anionic-amphoteric based antimicrobial shampoo. 4,329,334, Cl. 424-70.000.

Su, Dean T.; and Schubert, Warren R., to Colgate-Palmolive Company. Amphoteric-nonionic based antimicrobial shampoo. 4,329,335, Cl. 424-70.000.

Su, Dean T.; and Schubert, Warren R., to Colgate-Palmolive Company. Nonionic based antimicrobial shampoo. 4,329,336, Cl. 424-70.000.

Sugahara, Yujiro; Naito, Hiroyuki; Saito, Mamoru; and Tuchida, Hisashi, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Granular stabilizer for chlorine-containing polymers. 4,329,182, Cl. 106-243.000.

Sugino, Takashi; Ito, Kunio; Wada, Masaru; and Shimizu, Hirokazu, to Matsushita Electric Industrial Co., Ltd. Terraced substrate semiconductor laser. 4,329,661, Cl. 372-46.000.

Suhey, Richard P.: *See*—
Noll, Burton A.; and Suhey, Richard P., 4,328,857, Cl. 165-8.000.

Sulzer Brothers Ltd.: *See*—
Rutz, Peter, 4,328,739, Cl. 91-484.000.

Sumitomo Chemical Company, Limited: *See*—
Kokubo, Toshiyuki; and Yamao, Takashi, 4,329,440, Cl. 526-142.000.

Sunada, Yoichi; Takahashi, Yoshikazu; and Takitani, Masaru, to Toyo Stauffer Chemical Co., Ltd. Titanium trichloride catalytic component and method for homo- or co-polymerization of α-olefin. 4,329,251, Cl. 252-429.00B.

Sundell, George J.: *See*—
Lovrich, Vincent; and Sundell, George J., 4,329,572, Cl. 235-92.0EC.

Sundstrand Corporation: *See*—
Ballard, Welton R., 4,329,603, Cl. 310-61.000.

Survival Technology, Inc.: *See*—
Curley, Edward M.; and Homan, Gerlof, 4,328,802, Cl. 128-272.100.

Sutter, Franz; and Straumann, Fritz, to Institut Straumann AG. Universal joint prosthesis with cap. 4,328,593, Cl. 3-1.910.

Suzuki, Masayuki: *See*—
Murakami, Hiroyasu; Uchidoi, Masanori; Yamamichi, Masayoshi; Shinoda, Nobuhiko; Suzuki, Masayuki; and Ito, Tadashi, 4,329,034, Cl. 354-37.000.

Suzuki, Nobuya: *See*—
Sakamoto, Shigetoshi; and Suzuki, Nobuya, 4,328,681, Cl. 62-157.000.

Suzuki, Toshiro: *See*—
Gregorian, Roubik; and Suzuki, Toshiro, 4,329,599, Cl. 307-520.000.

Suzuki, Yasuro: *See*—
Owada, Takeyoshi; and Suzuki, Yasuro, 4,329,122, Cl. 417-365.000.

Suzuki, Yoshio: *See*—
Tamura, Nobuhiro; Fukuoka, Yohei; Nishikido, Joji; Yamamatsu, Setsuo; and Suzuki, Yoshio, 4,329,462, Cl. 544-387.000.

Suzuki, Yoshiro, to Olympus Optical Company Limited. Electrophotographic process. 4,329,414, Cl. 430-103.000.

Suzuki, Yukio; Iwasawa, Naozumi; and Watanabe, Tadashi, to Kansai Paint Co., Ltd. Water-dispersed coating composition comprising an acrylic graft polymer containing carboxyl groups, hydroxyl and/or amide groups. 4,329,266, Cl. 524-376.000.

Svensson, Percy: *See*—
Kalvenes, ystein; Krill, Carl-Henry; Svensson, Percy; and Helmersson, Knut, 4,329,178, Cl. 106-87.000.

Swerlick, Isadore, to Du Pont de Nemours, E. I., and Company. Coated, heat-sealable aromatic polymer film. 4,329,399, Cl. 428-422.000.

Swindell, William: *See*—
Barrett, Harrison H.; Swindell, William; and Greivenkamp, John E., Jr., 4,329,588, Cl. 250-445.00T.

Swiss Aluminium Ltd.: *See*—
Hardt, Jean, 4,328,905, Cl. 220-258.000.

Swisscal Holding S.A.: *See*—
Gossalter, Rene, 4,328,862, Cl. 165-158.000.

Sylvan, Richard: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Baisch, Herbert, 4,328,728, Cl. 83-471.300.

Syntex (U.S.A.) Inc.: *See*—
Nieminen, Timó, 4,329,587, Cl. 250-439.00P.

Syva Company: *See*—
Khanna, Pyare L.; and Ullman, Edwin F., 4,329,461, Cl. 544-375.000.
Singh, Prithipal; and Pirio, Marcel R., 4,329,502, Cl. 564-349.000.

Szabo, Georges: *See*—
Engelhard, Philippe; and Szabo, Georges, 4,329,258, Cl. 252-441.000.

Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,329,350, Cl. 424-258.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar R.T. 1,1-Disubstituted octahydro-indolo[2,3-a]quinolizines, process for the preparation thereof and compositions containing same. 4,329,350, Cl. 424-258.000.

Sze, Morgan C.: *See*—
Riegel, Herbert; Strangio, Vincent; and Sze, Morgan C., 4,329,525, Cl. 570-191.000.

Szego, Ferenc; and Makk, Antal, to Ferrokemia Ipari Szovetkezet. Compositions for use as cosmetics. 4,329,338, Cl. 424-180.000.

Szekacs, Gyorgy, to Egyesult Izzolampa es Villamossagi RT. Sealed-beam headlight. 4,329,614, Cl. 313-115.000.

Szigeti, Elemer. Method for stabilizing the texture of a plastic substance. 4,329,376, Cl. 427-4.000.

Szilagyi, Geza; Matyus, Peter; Kasztreiner, Endre; Balogh, Tibor; and Ila, Lajos, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of 6-(substituted amino)-3-pyridazinylhydrazines and their salts. 4,329,457, Cl. 544-114.000.

Sznopek, John L.; Lostak, Charles; Heisler, Robert W.; Ferraro, Joseph P.; and Kazienko, Henry J., to Manville Service Corporation. Method of making a coupling for rigid pressure pipe. 4,329,193, Cl. 156-162.000.

Szporny, Laszlo: *See*—
Rochricht, Julianna; Kisfaludy, Lajos; Kajtar, Marton; Palosi, Eva; and Szporny, Laszlo, 4,329,341, Cl. 424-244.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,329,350, Cl. 424-258.000.

T-Plastech Company: *See*—
Hutchison, V. James; and Robb, Wayne F., 4,328,605, Cl. 24-115.00G.

Tabata, Norikazu: *See*—
Yagi, Shigenori; Ogawa, Shuji; and Tabata, Norikazu, 4,329,662, Cl. 372-38.000.

Tabata, Youichiro: *See*—
Komura, Hirotsugu; Ueguri, Shigeo; and Tabata, Youichiro, 4,329,563, Cl. 219-121.00P.
Tadmor, Zehev: *See*—
Hold, Peter; and Tadmor, Zehev, 4,329,065, Cl. 366-97.000.
Tagami, Mutsukazu: *See*—
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,329,673, Cl. 335-288.000.
Tajima, Akira: *See*—
Yamaguchi, Shin; Tajima, Akira; and Ikemori, Keiji, 4,329,022, Cl. 350-426.000.
Takada, Toshiyuki: *See*—
Fujikawa, Tetsuzo; Takada, Toshiyuki; and Tamba, Shinichi, 4,328,769, Cl. 123-41.470.
Takahara, Yoshiyuki: *See*—
Asagao, Soichi; Nakatani, Masaru; Nakagawa, Shinsuke; Takahara, Yoshiyuki; and Okada, Naoki, 4,329,326, Cl. 423-308.000.
Takahashi, Kazuo: *See*—
Nagatani, Toshio; Habu, Takeshi; and Takahashi, Kazuo, 4,329,417, Cl. 430-264.000.
Takahashi, Keishiro: *See*—
Nishizawa, Jun-ichi; Okuno, Yasuo; and Takahashi, Keishiro, 4,329,625, Cl. 315-158.000.
Takahashi, Yoshikazu: *See*—
Sunada, Yoichi; Takahashi, Yoshikazu; and Takitani, Masaru, 4,329,251, Cl. 252-429.00B.
Takahashi, Yutaka: *See*—
Aihara, Mamoru; Takahashi, Yutaka; Nakajima, Yoshio; and Matsuura, Tsuyoshi, 4,329,030, Cl. 354-23.00D.
Takahata, Kazunori: *See*—
Taniguchi, Katsuo; Takahata, Kazunori; and An-Nen, Yoshiaki, 4,329,517, Cl. 568-804.000.
Takase, Sadao, to Nissan Motor Company, Limited. Rotational speed measuring system having a circuit for increasing the accuracy thereof. 4,329,645, Cl. 324-166.000.
Takashina, Naomitsu; Shimoi, Masahiro; and Iwamoto, Yoshinori, to Mitsubishi Gas Chemical Company, Inc. One package system cold-setting type coating compositions. 4,329,269, Cl. 525-366.000.
Takayama, Syuichi, to Olympus Optical Co., Ltd. Light source unit having a number of flash tubes. 4,329,629, Cl. 315-323.000.
Takeda Chemical Industries, Ltd.: *See*—
Miyashita, Osamu; Matsumura, Koichi; Shimadzu, Hiroshi; and Hashimoto, Naoto, 4,329,460, Cl. 544-301.000.
Takeda, Makoto; Uchide, Masayuki; and Iwane, Hiroshi, to Mitsubishi Petrochemical Co., Ltd. Substituted aryl ethylenes. 4,329,507, Cl. 568-332.000.
Takeda, Toshio; Amano, Takehisa; Isii, Sigeki; and Hamada, Seiya, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of fill-note generation. 4,328,732, Cl. 84-1.170.
Takeoka, Yoshihiko: *See*—
Kitajima, Tadayuki; Kasamura, Toshirou; Aoki, Tomohiro; Takeoka, Yoshihiko; and Namekata, Kiyokazu, 4,329,044, Cl. 355-15.000.
Takitani, Masaru: *See*—
Sunada, Yoichi; Takahashi, Yoshikazu; and Takitani, Masaru, 4,329,251, Cl. 252-429.00B.
Takusagawa, Masahito: *See*—
Yano, Mitsuhiro; Nishi, Hiroshi; Takusagawa, Masahito; and Nishitani, Yorimitsu, 4,329,660, Cl. 372-46.000.
Talon, Inc.: *See*—
Moertel, George B., 4,329,311, Cl. 264-285.000.
Talsma, Herbert; and Giffen, William M., Jr., to Standard Oil Company, The. Metal coatings from nitrile copolymer latexes. 4,329,401, Cl. 428-462.000.
Tamba, Shinichi: *See*—
Fujikawa, Tetsuzo; Takada, Toshiyuki; and Tamba, Shinichi, 4,328,769, Cl. 123-41.470.
Tamura, Nobuhiro; Fukuoka, Yohei; Nishikido, Joji; Yamamatsu, Setsuo; and Suzuki, Yoshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing carboxylic amides. 4,329,462, Cl. 544-387.000.
Tanaka, Akira; Hattori, Tadashi; and Nishida, Minoru, to Nippon Soken, Inc. Spark plug for internal combustion engines. 4,329,615, Cl. 313-141.000.
Tanaka, Hiroshi: *See*—
Yabutani, Kunihiro; Matsui, Hisanori; Tanaka, Hiroshi; and Kurono, Hitoshi, 4,329,479, Cl. 549-39.000.
Tanaka, Kazushi: *See*—
Hosaka, Akihiko; and Tanaka, Kazushi, 4,329,398, Cl. 428-413.000.
Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Semi-conductor inverter using complementary junction field effect transistor pair. 4,329,700, Cl. 357-22.000.
Tanaka, Tsuneo: *See*—
Ishihara, Shin-ichiro; Mori, Koshiro; Tanaka, Tsuneo; Nagata, Seiichi; and Fukai, Masakazu, 4,329,699, Cl. 357-2.000.
Tanaka, Yasuzo; and Furuto, Yoshio, to Furukawa Electric Co., Ltd., The. Superconducting compound stranded cable. 4,329,539, Cl. 174-128.00S.
Taniguchi, Katsuo; Takahata, Kazunori; and An-Nen, Yoshiaki, to Mitsui Petrochemical Industries Ltd. Process for production of mono- or di-ortho-methyl-substituted phenols by catalytic methylation and catalyst therefor. 4,329,517, Cl. 568-804.000.
Tanikawa, Kiyoshi; Yoshikawa, Masao; and Sato, Tsutomu, to Ricoh Co., Ltd. Methods for preparing plural layer organic electrophotographic elements. 4,329,416, Cl. 430-133.000.
Tanuma, Kinji, to National Research Institute for Metals. Flash welding method. 4,329,560, Cl. 219-100.000.
Tarumi, Niro; Tsuchiya, Makoto; and Sasaki, Kunio, to Kabushiki Kaisha Hoya Lens (Hoya Lens Corporation). Method for marking an indication to the lens. 4,329,378, Cl. 427-157.000.
Taubert, Klaus; Wehler, Herbert; and Bald, Alfred, to Amsted-Siemag Kette GmbH. Link for steel sprocket chains. 4,328,665, Cl. 59-88.000.
Tax, Lambert J. W. M., to Akzona Incorporated. Branched chain and cycloaliphatic esters of the androstane and oestrane series and pharmaceutical compositions containing same. 4,329,296, Cl. 260-397.400.
Taylor, Donald F. Automatic dump valve. 4,328,835, Cl. 137-869.000.
Taylor, Harold C. Color composing video system. 4,329,710, Cl. 358-81.000.
Taylor, Robert J.: *See*—
True, Daniel G.; and Taylor, Robert J., 4,328,736, Cl. 89-17.000.
Tazoe, Masaaki: *See*—
Fujiwara, Akiko; Hoshino, Tatsuo; and Tazoe, Masaaki, 4,329,339, Cl. 424-180.000.
TDK Electronics Co., Ltd.: *See*—
Hosaka, Akihiko; and Tanaka, Kazushi, 4,329,398, Cl. 428-413.000.
Te Ka de Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Markl, Georg, 4,329,677, Cl. 340-84.000.
Teague, Joe D.; and Wright, Paul J. Employing quicklime in stabilizing surface layers of the earth. 4,329,090, Cl. 405-263.000.
Teass, Horace A., Jr.; and McKernan, Patrick F., to McNab Incorporated. Ultra-clean cell assembly. 4,329,650, Cl. 324-450.000.
Technics Lambda International: *See*—
Beck, Michel, 4,329,135, Cl. 425-174.000.
Temming, Leonardus J., to Staalkat B.V. Apparatus for denesting and delivering the bottom one of a stack of trays for eggs. 4,328,908, Cl. 221-213.000.
Tenneco Chemicals, Inc.: *See*—
Buono, Frederick J.; and Hoch, Samuel, 4,329,263, Cl. 525-17.000.
Terlemezyan, Ekaterina I.: *See*—
Dimov, Kiril D.; Vassilev, Nikelay B.; Dimitrov, Dimiter G.; Terlemezyan, Ekaterina I.; Georgieva, Angelina H.; and Dimitrov, Borislav A., 4,329,185, Cl. 134-26.000.
Terneu, Robert; and Van Cauter, Albert, to BFG Glassgroup. Process for forming tin oxide glass coating. 4,329,379, Cl. 427-166.000.
Tesch, Bunter, to Breveteam S.A. Method and receptacle for growing plants. 4,328,641, Cl. 47-59.000.
Texaco Inc.: *See*—
Chou, Kechia J., 4,329,239, Cl. 252-51.50A.
Texeira, Patrick D.: *See*—
Pond, Charles R.; Texeira, Patrick D.; and Wilbert, Reynold E., 4,329,059, Cl. 356-353.000.
Textron, Inc.: *See*—
Williams, Roy C.; and Rogemoser, David R., 4,329,490, Cl. 560-90.000.
Tezuka, Shichigoro; Sato, Yoshinori; Shibata, Masaki; and Harikae, Nobuyuki, to Lotte Co., Ltd. Process for preparation of chewing gum. 4,329,369, Cl. 426-3.000.
Thomas, Bernard N. Snow plough assembly for a front end loader. 4,328,628, Cl. 37-117.500.
Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Contact lens container. 4,328,890, Cl. 206-5.100.
Thompson, Bruce L., to Amber Oil Process, Inc. Oil reconditioning system. 4,329,226, Cl. 210-180.000.
Thompson, Charles E.; and Newell, Roger G., to Burroughs Corporation. Method of reducing alpha-particle induced errors in an integrated circuit. 4,328,610, Cl. 29-571.000.
Thomson-CSF: *See*—
Lacombat, Michel; and Lefevre, Herve, 4,329,056, Cl. 356-350.000.
Tietze, Armin R.: *See*—
Denner, Horst B. W.; and Tietze, Armin R., 4,328,607, Cl. 29-169.500.
Tilford, L. Nelson: *See*—
Jackson, Isaac S.; and Tilford, L. Nelson, 4,329,314, Cl. 264-519.000.
Tilley, Jefferson W.: *See*—
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,329,289, Cl. 549-449.000.
Tilling, Basil B.: *See*—
Becktel, Robert L.; Greenwell, Robert P.; and Tilling, Basil B., 4,328,844, Cl. 141-302.000.
Todd, John J. Device for the gasification of liquids. 4,329,227, Cl. 210-220.000.
Tokico Ltd.: *See*—
Hamamatsu, Seiji, 4,328,738, Cl. 91-376.00R.
Tokuno, Masateru, to Rengo Co., Ltd. Slitter-scorer apparatus. 4,328,727, Cl. 83-106.000.
Tokyo Denryoku Kabushiki Kaisha: *See*—
Kotake, Tosio; Watanabe, Katuaki; and Koyanagi, Kaoru, 4,329,637, Cl. 322-20.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Nishimura, Shinichi; and Hanamura, Yoshihiko, 4,329,025, Cl. 351-7.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hamano, Tadayasu, 4,329,674, Cl. 336-92.000.
Kodama, Hisao, 4,329,720, Cl. 360-74.300.
Kotake, Tosio; Watanabe, Katuaki; and Koyanagi, Kaoru, 4,329,637, Cl. 322-20.000.
Mori, Masafumi; and Saito, Tutomu, 4,329,011, Cl. 350-6.600.
Tokyo Shibaura Electric Company, Limited: *See*—
Higa, Osamu; and Seki, Nagataka, 4,329,652, Cl. 328-72.000.

Tominaga, Michiaki: *See*—
Nakagawa, Kazuyuki; Murakami, Nanami; Yoshizaki, Shiro; Mori, Hideo; and Tominaga, Michiaki, 4,329,468, Cl. 546-158.000.
Tone, Robert P., to Gates Rubber Company, The. Shock-absorbing sprocket, drive assembly, and the like. 4,328,879, Cl. 180-219.000.
Topliss, John G.: *See*—
Neri, Rudolph O.; and Topliss, John G., 4,329,364, Cl. 424-324.000.
Toray Industries, Inc.: *See*—
Inouye, Yoshinori; Ando, Akio; and Nakashashi, Ryuichi, 4,328,749, Cl. 101-426.000.
Torossian, Alexandre: *See*—
Rosain, Claude; and Torossian, Alexandre, 4,329,607, Cl. 310-82.000.
Toshiba Silicone Co., Ltd.: *See*—
Hatanaka, Masayuki; and Kurita, Atsushi, 4,329,275, Cl. 524-862.000.
Townsley, Charles W.: *See*—
Detweiler, Michael B.; Lawrence, Paul J.; and Townsley, Charles W., 4,329,317, Cl. 422-58.000.
Townzen, David A.: *See*—
Goldschmidt, Robert E.; Ku, Charles C.; and Townzen, David A., 4,329,693, Cl. 346-33.0TP.
Toyo Kogyo Co., Ltd.: *See*—
Morita, Yasuyuki, 4,328,781, Cl. 123-570.000.
Yoshida, Rihee, 4,328,990, Cl. 296-222.000.
Toyo Rubber Industry Co., Ltd., The: *See*—
Uemura, Yukihisa, 4,328,850, Cl. 152-209.00R.
Toyo Silicon Co., Ltd.: *See*—
Kudo, Bosshi, 4,329,195, Cl. 156-617.0SP.
Toyo Stauffer Chemical Co., Ltd.: *See*—
Sunada, Yoichi; Takahashi, Yoshikazu; and Takitani, Masaru, 4,329,251, Cl. 252-429.00B.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Arai, Hajime, 4,328,717, Cl. 74-760.000.
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,328,779, Cl. 123-416.000.
Inada, Masami; Kitamura, Kazuhiko; Okumura, Shuji; Nonoyama, Takao; and Tsuji, Riichi, 4,328,832, Cl. 137-625.460.
Kishi, Tomomi; and Yamamoto, Yoshitaka, 4,329,559, Cl. 219-89.000.
Tracy, Joseph C.; and Herbst, Jan F., to General Motors Corporation. Hydrogen fuel storage and delivery system. 4,328,768, Cl. 123-1.00A.
Trane Company, The: *See*—
Brenneman, Daniel A., 4,329,701, Cl. 357-28.000.
Transcan Video Limited: *See*—
Attridge, Stephen P., 4,329,715, Cl. 358-214.000.
Triller, Adolf; and Gassenhuber, Helmut, to Optische Werke G. Rodenstock. Light-emitting diode arrangement. 4,329,737, Cl. 362-32.000.
Trimble, Roy L., to Signode Corporation. Quick acting automatic marking machine. 4,328,745, Cl. 101-7.000.
Trotman, Helen H.; and Trotman, Herbert H. Body supporting and spacing structure. 4,328,993, Cl. 297-453.000.
Trotman, Herbert H.: *See*—
Trotman, Helen H.; and Trotman, Herbert H., 4,328,993, Cl. 297-453.000.
True, Daniel G.; and Taylor, Robert J., to United States of America, Navy. Fuseless explosive propellant cartridge. 4,328,736, Cl. 89-17.000.
Truskolaski, Bernard S.; and Pohl, Daniel P., to Minnesota Mining and Manufacturing Company. Self-locking ribbon assemblies. 4,329,382, Cl. 428-4.000.
TRW Inc.: *See*—
Harrington, Alan L.; and Allison, Richard, 4,328,611, Cl. 29-580.000.
Tsai, James T.: *See*—
Colombo, Edward A.; and Tsai, James T., 4,329,052, Cl. 356-335.000.
Tschirky, John E.; and Geczy, Bela A., to Smith International, Inc. Sealed bearing means for in hole motors. 4,329,127, Cl. 418-48.000.
Tsuchiya, Makoto: *See*—
Tarumi, Niro; Tsuchiya, Makoto; and Sasaki, Kunio, 4,329,378, Cl. 427-157.000.
Tsuda, Munetaka, to Hitachi, Ltd. Impulse resonance spectrometer. 4,329,646, Cl. 324-307.000.
Tsuda, Shin: *See*—
Asano, Noriyuki; Niwa, Yukichi; Ohwada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,329,577, Cl. 250-201.000.
Tsuge, Noboru; Kuwakado, Satosi; and Shimogawa, Toshiaki, to Nippon Soken, Inc. Seat belt tensioning device. 4,328,976, Cl. 280-806.000.
Tsuji, Riichi: *See*—
Inada, Masami; Kitamura, Kazuhiko; Okumura, Shuji; Nonoyama, Takao; and Tsuji, Riichi, 4,328,832, Cl. 137-625.460.
Tsumura, Kenji; and Yamashita, Masayuki, to Oriental Metal Mfg. Co., Ltd. Process for distilling water and distillation apparatus. 4,329,205, Cl. 202-174.000.
Tsunekawa, Tokuichi: *See*—
Masunaga, Makoto; Kinoshita, Takao; Sakane, Toshio; Tsunekawa, Tokuichi; Hosoe, Kazuya; Amikura, Takashi; and Harigaya, Isao, 4,329,033, Cl. 354-25.000.
Tsuruta, Yuzo: *See*—
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Tuchida, Hisashi: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Saito, Mamoru; and Tuchida, Hisashi, 4,329,182, Cl. 106-243.000.
Tumber, Brian W.; and Davison, Michael J., to Lucas Industries Limited. Transducer calibration device. 4,328,697, Cl. 73-3.000.
Turczyk, Michael J., to Stauffer Chemical Company. Method of extruding discrete phase elastomer containing thermoplastic polymers. 4,329,310, Cl. 264-211.000.
Turid, Ronold, Heir: *See*—
Johansen, Aage M.; and Ronold, Olav A., deceased, 4,329,380, Cl. 427-236.000.
Turner, Neville G., to Rolls-Royce Limited. Products made by powder metallurgy and a method therefore. 4,329,175, Cl. 75-208.00R.
Twigg, Martyn V.: *See*—
Irvine, Elizabeth A.; and Twigg, Martyn V., 4,329,530, Cl. 585-259.000.
Tzikas, Athanassios, to Ciba-Geigy AG. Process for the preparation of vat dyes. 4,329,456, Cl. 544-113.000.
Uchida, Ryohei; Yamasaki, Tatsuo; Mimura, Munehiko; Hasimoto, Kosuke; and Kawabe, Sadanobu, to Mitsubishi Denki Kabushiki Kaisha. Rotation sensor device. 4,329,636, Cl. 318-721.000.
Uchide, Masayuki: *See*—
Takeda, Makoto; Uchide, Masayuki; and Iwane, Hiroshi, 4,329,507, Cl. 568-332.000.
Uchidoi, Masanori: *See*—
Murakami, Hiroyasu; Uchidoi, Masanori; Yamamichi, Masayoshi; Shinoda, Nobuhiko; Suzuki, Masayuki; and Ito, Tadashi, 4,329,034, Cl. 354-37.000.
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, to Kanetsu Kogyo Kabushiki Kaisha. Switchable permanent magnet holding device. 4,329,673, Cl. 335-288.000.
Uchiyama, Haruo: *See*—
Minoura, Kazuo; Kiyohara, Takehiko; and Uchiyama, Haruo, 4,329,012, Cl. 350-6.800.
Ueguri, Shigeo: *See*—
Komura, Hirotsugu; Ueguri, Shigeo; and Tabata, Youichiro, 4,329,563, Cl. 219-121.00P.
Ueki, Kazuhiko: *See*—
Akiyama, Seiji; Kurihara, Mamoru; and Ueki, Kazuhiko, 4,329,104, Cl. 414-139.000.
Uemura, Yukihisa, to Toyo Rubber Industry Co., Ltd., The. Radial tire for truck and bus having specified tread to tire width ratio. 4,328,850, Cl. 152-209.00R.
Ufford, Keith A.; and O'Neill, Edward G., to Medtronic, Inc. Ring electrode for pacing lead. 4,328,812, Cl. 128-786.000.
Uhl, Guenter: *See*—
Krapf, Heinz; Oppenlaender, Knut; and Uhl, Guenter, 4,329,176, Cl. 106-19.000.
Ullman, Edwin F.: *See*—
Khanna, Pyare L.; and Ullman, Edwin F., 4,329,461, Cl. 544-375.000.
Union Carbide Corporation: *See*—
Kavasmaneck, Percy R.; Stanton, David B.; and Sherman, Paul D., Jr., 4,329,520, Cl. 568-896.000.
McKenna, Eva J., 4,329,232, Cl. 210-614.000.
Miller, John C.; and Burnett, Archibald L., 4,329,313, Cl. 264-349.000.
Sherman, John D.; and Katsaros, Arthur T., 4,329,160, Cl. 55-62.000.
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., 4,329,388, Cl. 428-216.000.
Zupancic, Ronald L., 4,329,405, Cl. 429-56.000.
Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft: *See*—
Dolkemeyer, Wilfried; Erdt, Kurt; Hentges, Rene; and Meisenburg, Ewald, 4,329,329, Cl. 423-461.000.
Uniroyal Englebert: *See*—
Poque, Dionysius J.; Freudenstein, Georg; and Lorenz, Horst, 4,328,852, Cl. 152-359.000.
Uniroyal, Inc.: *See*—
Dighe, Deepak V.; Burton, Earl F.; and Wozniak, Robert J., 4,328,849, Cl. 152-176.000.
Unit Rig & Equipment Co.: *See*—
Satterwhite, Charles R., 4,329,087, Cl. 405-179.000.
United Gas Pipe Line Company: *See*—
Ghosh, Sambhunath; and Klass, Donald L., 4,329,428, Cl. 435-167.000.
United States Borax & Chemical Corporation: *See*—
Ramadorai, Gopalan; and Shaw, Douglas R., 4,329,223, Cl. 209-167.000.
United States of America
Agriculture: *See*—
Sexton, Thomas J., 4,329,337, Cl. 424-105.000.
Springer, Edward L., 4,329,368, Cl. 424-334.000.
Air Force: *See*—
Goldie, Harry, 4,329,688, Cl. 343-17.700.
Army: *See*—
Conrad, Raymond W.; and Kidron, Aryeh, 4,329,583, Cl. 250-330.000.
Drzewiecki, Tadeusz M., 4,328,699, Cl. 73-30.000.
Gilbert, Everett E.; and Sollott, Gilbert P., 4,329,522, Cl. 568-941.000.
Monte, Anthony J.; and Wahoski, Ernest C., 4,328,868, Cl. 169-62.000.
Riley, Leon H.; and Edlin, George R., 4,329,580, Cl. 250-215.000.
Roane, Asa E., 4,329,131, Cl. 425-6.000.
Energy: *See*—
Dagenhart, William K.; and Stirling, William L., 4,329,586, Cl. 250-426.000.

Watson, Harold, 4,329,595, Cl. 307-107.000.
Interior: *See—*
Gunderman, Robert J.; and Riley, Michael W., 4,328,901, Cl. 220-88.00A.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Fymat, Alain L. Frequency-scanning particle size spectrometer. 4,329,053, Cl. 356-336.000.
National Aeronautics and Space Administration: *See—*
Banks, Bruce A.; Weigand, Albert J.; and Sovey, James S., 4,329,385, Cl. 428-141.000.
Johnston, Richard P.; Knapp, Malcolm H.; and Coulson, Charles E., 4,329,114, Cl. 415-145.000.
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Alsup, James M., 4,329,651, Cl. 328-14.000.
Howarth, Robert F., 4,329,540, Cl. 174-153.00R.
True, Daniel G.; and Taylor, Robert J., 4,328,736, Cl. 89-17.000.
U.S. Philips Corporation: *See—*
Dallas, William J.; Linde, Rolf; and Weiss, Hermann, 4,329,020, Cl. 350-162.0SF.
Schoenmakers, Johannes J. M., 4,329,723, Cl. 360-109.000.
United States Surgical Corporation: *See—*
Hill, Jeremy R.; and Malinouskas, Donald, 4,328,810, Cl. 128-680.000.
United Technologies Corporation: *See—*
Doman, Glidden S., 4,329,117, Cl. 416-170.00R.
University of Kentucky Research Foundation: *See—*
Stahly, Tim S., 4,329,359, Cl. 424-312.000.
University of Rochester, The: *See—*
Mourou, Gerard, 4,329,686, Cl. 343-6.00R.
University Patents, Inc.: *See—*
Barrett, Harrison H.; Swindell, William; and Greivenkamp, John E., Jr., 4,329,588, Cl. 250-445.00T.
Uniweld Products, Incorporated: *See—*
Pearl, David S., II, 4,328,948, Cl. 251-149.600.
Uno, Kazutoyo; and Miki, Hisaya, to Mitsui Petrochemical Industries, Ltd. Process for purifying ketones. 4,329,510, Cl. 568-411.000.
Unterleitner, Fred C.: *See—*
Kapany, Narinder S.; and Unterleitner, Fred C., 4,329,017, Cl. 350-96.150.
UOP Inc.: *See—*
Antos, George J., 4,329,259, Cl. 252-441.000.
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,329,280, Cl. 260-97.600.
Homeier, Edwin H.; Imai, Tamotsu; Mackowiak, David E.; and Guzolek, Catherine E., 4,329,521, Cl. 568-909.000.
Kwong, Gary W. Y.; and Levy, Joseph, 4,329,505, Cl. 564-476.000.
Lester, George R.; and Welsh, Lawrence B., 4,329,260, Cl. 252-446.000.
Updike, Mark H.; and Calton, Gary J., to W. R. Grace & Co. Fermentative preparation of L-isoleucine. 4,329,427, Cl. 435-116.000.
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Utne, Torleif; and Jobson, Ronald B., to Merck & Co., Inc. Displacement purification of salts. 4,329,469, Cl. 546-203.000.
Valentian, Dominique R.; Bartoli, Cesare M.; Pfeffer, Heinrich A.; Herhudt v. Rohden, Hans-Joachim; and Stewart, Duncan, to European Space Research Organisation, The. Field-emission ion source and ion thruster apparatus comprising such sources. 4,328,667, Cl. 60-202.000.
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Vana, John H., to Emhart Industries, Inc. Head pressure control including means for sensing condition of refrigerant. 4,328,682, Cl. 62-196.00B.
van Aken, Andreas B.; Blytas, George C.; and Visser, Rene M., to Shell Oil Company. Process for the purification of water. 4,329,233, Cl. 210-673.000.
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Vander Meer, Clayton H.; and Doane, Martin R., to Rapistan, Inc. Data storage means and reading system therefor. 4,329,576, Cl. 235-489.000.
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van der Weijst, Ludovicus B. J. O.; De Vries, Enno B.; and Heiszwolf, Gerard J., to Shell Oil Company. Method for controlling runaway decomposition in the preparation of hydrocarbon hydroperoxides. 4,329,514, Cl. 568-577.000.
Van Ginkel, Mannes; and Plug, Jan, to Moba Holding Barneveld B.V. Bag closing apparatus. 4,328,654, Cl. 53-285.000.
Van Hulle, Erick, to Societe Anonyme dite: Visiodis. System for automatically substituting television signals at a head station for a cable network. 4,329,675, Cl. 358-86.000.
Van Laerhoven, Willy: *See—*
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Vayenas, Costas G.; and Stoukides, Michael, to Massachusetts Institute of Technology. Method and apparatus for converting ethylene to ethylene oxide. 4,329,208, Cl. 204-59.00R.
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Velenyi, Louis J.; and Krupa, Andrew S., to Standard Oil Company, The. Isomerization of aldehydes to ketones. 4,329,506, Cl. 568-310.000.
Vella, Alexander J., to Pace Incorporated. Portable electronics repair system including improved desolderer for use therewith. 4,328,920, Cl. 228-20.000.
Verley, Donald, to McCann's Engineering & Manufacturing Company. Delayed action liquid level sensing apparatus. 4,329,550, Cl. 200-84.00C.
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Vero Electronics GmbH: *See—*
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Vesley, George F.; and Moon, John D., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive tape produced from photoactive mixture of acrylic monomers and polynuclear-chromophore-substituted halomethyl-2-triazine. 4,329,384, Cl. 428-40.000.
Vicik, Stephen J.; Kohler, William J.; and Funderburk, James O., Jr., to Union Carbide Corporation. Multilayer film. 4,329,388, Cl. 428-216.000.
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Voelker, Wolfgang; Schmitt, Alfons; and Radeck, Fritz, to Felten & Guilleaume Carlswerk Aktiengesellschaft. Process for coating wire with insulation. 4,329,377, Cl. 427-9.000.
Vogelsberg, Dieter; and Koch, Klaus, to Siemens Aktiengesellschaft. Apparatus for the SZ-twisting of stranding elements of electric or optical cables and lines. 4,328,664, Cl. 57-293.000.
Vogt, Frederick G., deceased (by Vogt, Mary J., executrix); and Sparrell, Patricia T., to Betz, Laboratories, Inc. Low level chromate-based corrosion inhibition in aqueous mediums. 4,329,250, Cl. 252-389.00R.
Vogt, Mary J., executrix: *See—*
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Vollbrecht, Heinz-Rudiger; and Wagner, Fritz, to SKW Trostberg Aktiengesellschaft. Cyanuric chloride mixtures and process for producing same. 4,329,325, Cl. 423-267.000.
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Vydra, Charles; and Parekh, Bhupendra M., to Sherritt Gordon Mines Limited. Method and treatment of a gaseous mixture of ammonia, carbon dioxide and water vapor. 4,329,320, Cl. 423-1.000.
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Walls, Thomas J. Multi-sport exerciser. 4,328,964, Cl. 272-136.000.
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Neumann, Manfred H.; Wallstab, Gunter H.; Heike, Lutz R.; Zimmerman, Frank U.; and Durante, Lawrence A., 4,329,643, Cl. 324-158.00F.
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Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., 4,328,999, Cl. 308-6.00C.
Walters, William. Pump protector apparatus. 4,329,120, Cl. 417-12.000.
Wang, Robert, to Heurtey Metallurgie. Method for cooling metal articles. 4,329,188, Cl. 148-143.000.
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Wartinger, Raymond C.: *See—*
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Watson, Harold, to United States of America, Energy. AC Resonant charger with charge rate unrelated to primary power frequency. 4,329,595, Cl. 307-107.000.
Webb, Jimmy L.; and Mehta, Bharat M., to General Electric Company. Method for making aromatic bis(ether anhydride)s. 4,329,291, Cl. 549-241.000.
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Webb, Jimmy L., to General Electric Company. Method for making aromatic bis(ether phthalic acid) or aromatic bis(ether anhydride). 4,329,496, Cl. 562-468.000.
Wegel, Erich, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Hold-down for use on feed table of printing press. 4,328,961, Cl. 271-236.000.
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Werne, Stig. Device for choke adjustment. 4,329,137, Cl. 431-75.000.
West, Terence H., to Priam Corporation. Enclosed disc drive having combination filter assembly. 4,329,722, Cl. 360-98.000.
Westcott, Robert F.; and Delamater, John R., to American Hoechst Corporation. Method for forming plastic sheet. 4,329,307, Cl. 264-160.000.
Westermayer, Jorg, to Siemens Aktiengesellschaft. Circuit arrangement for the control of semi-duplex data transmission system. 4,329,545, Cl. 178-22.030.
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Wild, Alfred, to Siemens Aktiengesellschaft. Circuit arrangement for an electronic d.c. telegraph transmitter. 4,329,542, Cl. 178-69.00R.
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Yabutani, Kunihiro; Matsui, Hisanori; Tanaka, Hiroshi; and Kurono, Hitoshi, to Nihon Nohyaku Co., Ltd. Process for producing 1,3-dithiol-2-ylidene malonic acid dialkyl esters. 4,329,479, Cl. 549-39.000.
Yagi, Shigenori; Ogawa, Shuji; and Tabata, Norikazu, to Mitsubishi Denki Kabushiki Kaisha. Silent discharge gas laser. 4,329,662, Cl. 372-38.000.
Yamada, Akitoshi, to Matsushita Electric Industrial Co., Ltd. Sound reproduction system for motor vehicle. 4,329,544, Cl. 179-1.0VE.
Yamada, Seiji: *See—*
Sahara, Masayoshi; Kobori, Toshio; and Yamada, Seiji, 4,329,035, Cl. 354-37.000.
Yamagata, Takaaki: *See—*
Asano, Noriyuki; Niwa, Yukichi; Ohwada, Mitsutoshi; Yamagata, Takaaki; and Tsuda, Shin, 4,329,577, Cl. 250-201.000.
Yamagiwa, Akira, to Hitachi, Ltd. Logic circuit. 4,329,597, Cl. 307-455.000.
Yamaguchi, Hiroaki: *See—*
Hattori, Tadashi; Yamaguchi, Hiroaki; Ootsuka, Yoshinori; Goto, Kenji; and Sawada, Daisaku, 4,328,779, Cl. 123-416.000.
Yamaguchi, Shin; Tajima, Akira; and Ikemori, Keiji, to Canon Kabushiki Kaisha. Two group type zoom lens with wide image angle. 4,329,022, Cl. 350-426.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Yoshida, Keisuke, 4,328,878, Cl. 180-182.000.
Yamamatsu, Setsuo: *See—*
Tamura, Nobuhiro; Fukuoka, Yohei; Nishikido, Joji; Yamamatsu, Setsuo; and Suzuki, Yoshio, 4,329,462, Cl. 544-387.000.
Yamamichi, Masayoshi: *See—*
Murakami, Hiroyasu; Uchidoi, Masanori; Yamamichi, Masayoshi; Shinoda, Nobuhiko; Suzuki, Masayuki; and Ito, Tadashi, 4,329,034, Cl. 354-37.000.
Yamamoto, Kaichi; and Yoshimoto, Kazuo, to Sony Corporation. Digital signal processing apparatus. 4,329,708, Cl. 358-36.000.
Yamamoto, Yoshitaka: *See—*
Kishi, Tomomi; and Yamamoto, Yoshitaka, 4,329,559, Cl. 219-89.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,329,455, Cl. 544-89.000.
Yamao, Takashi: *See—*
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Yamasaki, Tatsuo: *See—*
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Yamashita, Masayuki: *See—*
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Yamaya, Hiroshi: *See—*
Kawai, Senji; Morimoto, Yoshihumi; Watanabe, Masayuki; Yamaya, Hiroshi; Kurohata, Hitoshi; and Nakamura, Joji, 4,329,665, Cl. 333-182.000.
Yamazaki, Shigeyuki: *See—*
Shinozaki, Tadashi; Hashimoto, Takashi; and Yamazaki, Shigeyuki, 4,329,139, Cl. 431-350.000.
Yamori, Akio; Saito, Akira; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Thermosetting unsaturated polyester resin composition and method for preparation thereof. 4,329,438, Cl. 525-64.000.
Yanagisawa, Kiyoshi: *See—*
Uchikune, Mamoru; Yanagisawa, Kiyoshi; Tagami, Mutsukazu; Shimizu, Taketo; Horiuchi, Kunio; and Sakaguchi, Hiroo, 4,329,673, Cl. 335-288.000.

Yanagishita, Hitoshi: *See*—
Sato, Atushi; Shimizu, Isoo; Endo, Keizi; and Yanagishita, Hitoshi, 4,329,536, Cl. 174-25.00C.

Yang, Kang; Nield, Gerald L.; and Washecheck, Paul H., to Conoco Inc. Catalyst removal from alcohol alkoxylates. 4,329,515, Cl. 568-621.000.

Yano, Mitsuhiro; Nishi, Hiroshi; Takusagawa, Masahito; and Nishitani, Yorimitsu, to Fijitsu Limited. Semiconductor light emitting device. 4,329,660, Cl. 372-46.000.

Yasuhara, Seishi, to Nissan Motor Co., Ltd. Distributor-type fuel injection pump governor. 4,328,777, Cl. 123-364.000.

Yee, James S., to Boeing Company, The. Microstrip antenna structure having stacked microstrip elements. 4,329,689, Cl. 343-700.0MS.

Yoshida, Hiroshi, to Yoshida Kogyo K.K. Stop fixing device for slide fastener. 4,328,918, Cl. 227-83.000.

Yoshida, Keisuke, to Yamaha Hatsudoki Kabushiki Kaisha. Mount for steering skis for snowmobiles. 4,328,878, Cl. 180-182.000.

Yoshida Kogyo K.K.: *See*—
Yoshida, Hiroshi, 4,328,918, Cl. 227-83.000.

Yoshida, Rihee, to Toyo Kogyo Co. Ltd. Sun-roof structures for automobile bodies. 4,328,990, Cl. 296-222.000.

Yoshida, Yutaka; Ishige, Ryohei; Yabu, Hiroaki; and Nabeshima, Yasuo, to Hitachi, Ltd. Running track control apparatus for trackless moving body. 4,329,632, Cl. 318-587.000.

Yoshikawa, Masao: *See*—
Tanikawa, Kiyoshi; Yoshikawa, Masao; and Sato, Tsutomu, 4,329,416, Cl. 430-133.000.

Yoshikazu, Hayashi, to Kabushiki Kaisha Airin. Apparatus for producing crackers. 4,328,741, Cl. 99-332.000.

Yoshimoto, Kazuo: *See*—
Yamamoto, Kaichi; and Yoshimoto, Kazuo, 4,329,708, Cl. 358-36.000.

Yoshizaki, Shiro: *See*—
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Young, Lewis B.: *See*—
Haag, Werner O.; and Young, Lewis B., 4,329,509, Cl. 568-385.000.

Youssef, Kamal A. Instant culture media and method of sterilizing same. 4,329,431, Cl. 435-253.000.

Yu, James H.: *See*—
Denlinger, George W.; Wiley, Robert A.; and Yu, James H., 4,329,696, Cl. 346-75.000.

Yuan, Edward L.: *See*—
Goff, David L.; Yuan, Edward L.; and Proskow, Stephen, 4,329,419, Cl. 430-283.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Mann, Egon; and Eymuller, Helmut, 4,329,064, Cl. 366-61.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi; Okuno, Yasuo; and Takahashi, Keishiro, 4,329,625, Cl. 315-158.000.

Zambelli, Adolfo: *See*—
Beach, David L.; Lunden, Richard W.; and Zambelli, Adolfo, 4,329,255, Cl. 252-429.00B.

Zamek, Otto S.; Pauze', Denis R.; and Jablonski, Richard J., to General Electric Company. Electrical conductors coated with polyester imide wire enamels. 4,329,397, Cl. 428-379.000.

Zampiello, Albert N., to Raytheon Company. Laser gyro oscillation suppression. 4,329,057, Cl. 356-350.000.

Zang, Robert, to ASA S.A. Device for holding a tubular support spooling textile materials. 4,328,928, Cl. 242-18.0DD.

Zeagler, Larry D.: *See*—
Hackman, Edward B.; Zeagler, Larry D.; McLaughlin, James S.; and Peabody, Carl M., 4,329,511, Cl. 568-454.000.

Zelenskaya, Militsa N.: *See*—
Mitrofanova, Alla K.; and Zelenskaya, Militsa N., 4,329,238, Cl. 252-12.000.

Zenk, Meinhard; Etschenberg, Eugen; and Graf, Erich, to Nattermann & Cie GmbH. Use of rosmarinic acid in the treatment of inflammations and pharmaceutical products used therein. 4,329,361, Cl. 424-317.000.

Zimmerman, Frank U.: *See*—
Neumann, Manfred H.; Wallstab, Gunter H.; Heike, Lutz R.; Zimmerman, Frank U.; and Durante, Lawrence A., 4,329,643, Cl. 324-158.00F.

Zimmerman, John C., to Halliburton Company. Check valve assembly. 4,328,866, Cl. 166-317.000.

Zoudlik, Adolph F. Rope-actuated implements. 4,328,987, Cl. 294-111.000.

Zouzoulas, John, to Andco Actuator Products, Inc. Actuator activated switching mechanism. 4,328,885, Cl. 192-142.00R.

Zuech, Ernest A.: *See*—
Murtha, Timothy P.; and Zuech, Ernest A., 4,329,531, Cl. 585-268.000.

Zumstein, Bruno, to BBC Brown, Boveri & Company Limited. Bypass control apparatus for turbocharged internal-combustion engines. 4,328,672, Cl. 60-606.000.

Zupancic, Ronald L., to Union Carbide Corporation. Electrochemical cell having a safety vent closure. 4,329,405, Cl. 429-56.000.

Zurbuchen, Jacques; and Leutenegger, Willi, to Ciba-Geigy Corporation. Process for the dyeing of fibre material. 4,329,146, Cl. 8-580.000.

Zweigle, Maurice L., to Dow Chemical Company, The. Preparing an aqueous dispersion of colloidal size particles of a water-insoluble polysaccharide derivative. 4,329,451, Cl. 536-77.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF MAY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abramczyk, Richard F.: *See—*
Ross, Benjamin J.; Toth, James M.; Abramczyk, Richard F.; and Coy, Gerald R., Re. 30,926, Cl. 73-638.000.

Anders, Gene A.: *See—*
Smith, B. Clark; and Anders, Gene A., Re. 30,925, Cl. 60-733.000.

Brown, Maurice H. Terminal forming and installing apparatus. Re. 30,927, Cl. 83-513.000.

Canon Kabushiki Kaisha: *See—*
Katayama, Hajime; Tsukada, Syusei; Kitajima, Tadayuki; and Kuge, Tsukasa, Re. 30,924, Cl. 15-256.510.

Caterpillar Tractor Co.: *See—*
Fuzzell, Joe E.; and Turnquist, Paul E., Re. 30,928, Cl. 123-333.000.
Smith, B. Clark; and Anders, Gene A., Re. 30,925, Cl. 60-733.000.

Coy, Gerald R.: *See—*
Ross, Benjamin J.; Toth, James M.; Abramczyk, Richard F.; and Coy, Gerald R., Re. 30,926, Cl. 73-638.000.

Fuzzell, Joe E.; and Turnquist, Paul E., to Caterpillar Tractor Co. Engine control. Re. 30,928, Cl. 123-333.000.

Katayama, Hajime; Tsukada, Syusei; Kitajima, Tadayuki; and Kuge, Tsukasa, to Canon Kabushiki Kaisha. Cleaning apparatus for electrophotography. Re. 30,924, Cl. 15-256.510.

Kitajima, Tadayuki: *See—*
Katayama, Hajime; Tsukada, Syusei; Kitajima, Tadayuki; and Kuge, Tsukasa, Re. 30,924, Cl. 15-256.510.

Kuge, Tsukasa: *See—*
Katayama, Hajime; Tsukada, Syusei; Kitajima, Tadayuki; and Kuge, Tsukasa, Re. 30,924, Cl. 15-256.510.

Maimets, Lembit. Collapsible tunnel liner section and method of lining a tunnel. Re. 30,929, Cl. 405-150.000.

Republic Steel Corporation: *See—*
Ross, Benjamin J.; Toth, James M.; Abramczyk, Richard F.; and Coy, Gerald R., Re. 30,926, Cl. 73-638.000.

Ross, Benjamin J.; Toth, James M.; Abramczyk, Richard F.; and Coy, Gerald R., to Republic Steel Corporation. Ultrasonic inspection. Re. 30,926, Cl. 73-638.000.

Smith, B. Clark; and Anders, Gene A., to Caterpillar Tractor Co. Fuel vaporizing combustor tube. Re. 30,925, Cl. 60-733.000.

Toth, James M.: *See—*
Ross, Benjamin J.; Toth, James M.; Abramczyk, Richard F.; and Coy, Gerald R., Re. 30,926, Cl. 73-638.000.

Tsukada, Syusei: *See—*
Katayama, Hajime; Tsukada, Syusei; Kitajima, Tadayuki; and Kuge, Tsukasa, Re. 30,924, Cl. 15-256.510.

Turnquist, Paul E.: *See—*
Fuzzell, Joe E.; and Turnquist, Paul E., Re. 30,928, Cl. 123-333.000.

LIST OF DESIGN PATENTEES

A.Ahlstrom Osakeyhtio: *See—*
Sarpaneva, Timo, 264,384, Cl. D26-9.000.

American District Telegraph Company: *See—*
Guscott, John K.; and Thornton, H. Patrick, 264,318, Cl. D10-106.000.
Guscott, John K.; and Thornton, H. Patrick, 264,319, Cl. D10-106.000.

American Sheds, Inc.: *See—*
Heather, Harvey N., 264,288, Cl. D6-168.000.

AMF Incorporated: *See—*
Van Dyke, Eddy G.; and Sheeley, Eugene L., 264,368, Cl. D21-220.000.

Andrews, Melvin R. Rolling wheel toy. 264,371, 5-11-82, Cl. D21-240.000.

Ankarswed, Sven J., to Ankarswedshus AB Vasteras. Foundation beam. 264,382, 5-11-82, Cl. D25-78.000.

Ankarswedshus AB Vasteras: *See—*
Ankarswed, Sven J., 264,382, Cl. D25-78.000.

Arino, Jose L. B., to Legar, S.A. Ball. 264,365, 5-11-82, Cl. D21-205.000.

Askew, Aubrey, to Dunlop Limited. Shoe. 264,268, 5-11-82, Cl. D2-310.000.

Austin, John J., to Champion International Corporation. Container. 264,313, 5-11-82, Cl. D9-416.000.

Blank, Elliott E.: *See—*
Weckman, Richard L.; and Blank, Elliott E., 264,309, Cl. D9-376.000.

Blavat, David W. Christmas tree stand. 264,282, 5-11-82, Cl. D6-105.000.

Boyd, Raymond. Lighted and foldable hand mirror. 264,387, 5-11-82, Cl. D28-67.000.

Briggs, Eugene C.; Shaftner, Robert F.; and Giambrone, Harry J., to Koehring Company. Portable heater. 264,374, 5-11-82, Cl. D23-123.000.

Brinley, Robert E., to Scovill Inc. Pull tab for slide fastener. 264,270, 5-11-82, Cl. D2-415.000.

Brinley, Robert E., to Scovill Inc. Pull tab for slide fastener. 264,271, 5-11-82, Cl. D2-415.000.

Brinley, Robert E., to Scovill Inc. Pull tab for slide fastener. 264,272, 5-11-82, Cl. D2-415.000.

Brinley, Robert E., to Scovill Inc. Slide fastener pull tab. 264,273, 5-11-82, Cl. D2-415.000.

Campbell, George E., to Clorox Company, The. Bottle. 264,308, 5-11-82, Cl. D9-376.000.

Campbell, Hugh G. Interlock crib. 264,383, 5-11-82, Cl. D25-80.000.

Campion, Stanley F., executor: *See—*
Jensen, George B., deceased; and Campion, Stanley F., executor, 264,296, Cl. D7-23.000.

Canon Kabushiki Kaisha: *See—*
Masaki, Nobuo; and Nagaoka, Tateki, 264,345, Cl. D16-31.000.

Capelouto, Isidore. Perfume bottle. 264,307, 5-11-82, Cl. D9-352.000.

Carney, Albert P.: *See—*
Lage, David P.; and Carney, Albert P., 264,295, Cl. D6-245.000.

Chamberlain, Joseph G. Woodstove. 264,373, 5-11-82, Cl. D23-97.000.

Champion International Corporation: *See—*
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Charlton Company, The: *See—*
Klein, Richard S., 264,289, Cl. D6-175.000.

Che, Francis Y. W., to Nimslo Technology, Inc. Multiple lens camera. 264,343, 5-11-82, Cl. D16-7.000.

Christian, Daniel H.: *See—*
Sharp, James M.; and Christian, Daniel H., 264,338, Cl. D14-58.000.

Chrones, Anthony, to GPC, Inc. Nipple. 264,380, 5-11-82, Cl. D24-46.000.

Clarion Co. Ltd.: *See—*
Hisatsune, Toshiyuki, 264,333, Cl. D14-7.000.
Hisatsune, Toshiyuki, 264,334, Cl. D14-7.000.

Clarke, Martin: *See—*
Miller, Paul D.; Thaler, Martin; and Clarke, Martin, 264,344, Cl. D16-11.000.

Clorox Company, The: *See—*
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Weckman, Richard L.; and Blank, Elliott E., 264,309, Cl. D9-376.000.

Coats & Clark, Inc.: *See—*
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Einhorn, Ruediger, 264,303, Cl. D8-367.000.

Cole, Darwin B. Van. 264,324, 5-11-82, Cl. D12-99.000.

Conair Corporation: *See—*
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Cooper, Marvin, to Dynamic Classics, Ltd. Hanging suitcase. 264,266, 5-11-82, Cl. D3-71.000.

Design Alliance, Inc.: *See—*
Mariol, James F., 264,362, Cl. D21-129.000.

Doggart, John, to V & E Friedland Limited. Wall chime. 264,320, 5-11-82, Cl. D10-118.000.

Dresens, Matthew. Electrical wiring trainer. 264,351, 5-11-82, Cl. D19-62.000.

Dryden, Gale E. Valved manifold for semi-open, non-rebreathing anesthesia. 264,388, 5-11-82, Cl. D29-7.000.

Dumoulin, Donald D. Flexible strip plug. 264,330, 5-11-82, Cl. D13-28.000.
Dunlop Limited: *See—*
Askew, Aubrey, 264,268, Cl. D2-310.000.
Dynamic Classics, Ltd.: *See—*
Cooper, Marvin, 264,266, Cl. D3-71.000.
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Einhorn, Ruediger, to Coats and Clark, Inc. Hook. 264,303, 5-11-82, Cl. D8-367.000.
Electro Mark Corporation: *See—*
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Entex Industries, Inc.: *See—*
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Ervan Guttman Company, The: *See—*
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Farris, Lawrence F.: *See—*
Nicholson, William J.; and Farris, Lawrence F., 264,336, Cl. D14-34.000.
Folks, Edward G. Helicopter body. 264,329, 5-11-82, Cl. D12-327.000.
Frederick, Roderick J. Market check out stand. 264,285, 5-11-82, Cl. D6-143.000.
GAF Corporation: *See—*
Miller, Paul D.; Thaler, Martin; and Clarke, Martin, 264,344, Cl. D16-11.000.
Gardisette International AG: *See—*
Stocker, Hans, 264,389, Cl. D92-1.00K.
General Electric Company: *See—*
Huntington, Robert K., 264,335, Cl. D14-12.000.
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Giambrone, Harry J.: *See—*
Briggs, Eugene C.; Shaftner, Robert F.; and Giambrone, Harry J., 264,374, Cl. D23-123.000.
Gida, Walter L. Putter. 264,367, 5-11-82, Cl. D21-218.000.
Gillette Company, The: *See—*
Waines, Peter L., 264,278, Cl. D6-28.000.
Goutchat, Maurice. Receptacle for stacking sheet material. 264,352, 5-11-82, Cl. D19-92.000.
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Chrones, Anthony, 264,380, Cl. D24-46.000.
Griswold, Wayne. Bicycle rack. 264,325, 5-11-82, Cl. D12-115.000.
Grubb, Lawrence B.; Simpson, Danny E.; Hoffman, Louis S.; and Williams, David M., to Johnson & Johnson Baby Products Company. Rattle ball and handling toy. 264,359, 5-11-82, Cl. D21-65.000.
Gunn, Roderick W. Matte box attachment for cameras. 264,346, 5-11-82, Cl. D16-38.000.
Guscott, John K.; and Thornton, H. Patrick, to American District Telegraph Company. Infrared intrusion detection system housing. 264,318, 5-11-82, Cl. D10-106.000.
Guscott, John K.; and Thornton, H. Patrick, to American District Telegraph Company. Infrared intrusion detection system housing. 264,319, 5-11-82, Cl. D10-106.000.
Guttman, Ervan E., to Ervan Guttman Company, The. Candy dipping tool. 264,298, 5-11-82, Cl. D7-103.000.
Haigh, Paul, to Knoll International, Inc. Table. 264,291, 5-11-82, Cl. D6-177.000.
Hall, Stephen: *See—*
Heritage, Robert; and Hall, Stephen, 264,386, Cl. D26-63.000.
Hanzawa, Tsuneo, to Entex Industries, Inc. Electronic hand-held baseball game housing or the like. 264,355, 5-11-82, Cl. D21-13.000.
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Litchfield, Leon G.; and Hardy, Terence, 264,293, Cl. D6-191.000.
Heather, Harvey N., to American Sheds, Inc. Combined storage chest and table. 264,288, 5-11-82, Cl. D6-168.000.
Heinrich, Joel S.; and Stewart, R. Bruce, to Micropin Corporation. Combined light and ball game housing. 264,354, 5-11-82, Cl. D21-8.000.
Heritage, Robert; and Hall, Stephen. Spotlight fitting. 264,386, 5-11-82, Cl. D26-63.000.
Hisatsune, Toshiyuki, to Clarion Co. Ltd. Automobile cassette player. 264,333, 5-11-82, Cl. D14-7.000.
Hisatsune, Toshiyuki, to Clarion Co. Ltd. Motor vehicular cassette player. 264,334, 5-11-82, Cl. D14-7.000.
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Huliba, David A.; and Robinson, Lonnie P., to Mead Corporation, The. Ink jet print head module. 264,349, 5-11-82, Cl. D18-22.000.
Huntington, Robert R., to General Electric Company. Ornamental design for a microphone. 264,335, 5-11-82, Cl. D14-12.000.
Iftikar, Syed H.; Reeck, David L.; and Shugart, Alan F., to Shugart Technology. Disc drive assembly. 264,340, 5-11-82, Cl. D14-109.000.
Imm, Donald E., to Zero Corporation. Pin socket insertion tool. 264,300, 5-11-82, Cl. D8-28.000.
International Telephone and Telegraph Corporation: *See—*
Sharp, James M.; and Christian, Daniel H., 264,338, Cl. D14-58.000.
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Jackson, Albert P. Divot repair tool. 264,369, 5-11-82, Cl. D21-234.000.
Jacobsen, Kenneth G. Paint box kit. 264,350, 5-11-82, Cl. D19-35.000.
Jensen, George B., deceased; and by Campion, Stanley F., executor, to Syracuse China Corporation. Bain-marie or similar article. 264,296, 5-11-82, Cl. D7-23.000.
Johannes, Michael W., to Owens Service Corporation. Speed control mechanism. 264,342, 5-11-82, Cl. D15-149.000.
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Johnson, Marshall B.: *See—*
Williams, Robert A.; and Johnson, Marshall B., 264,341, Cl. D15-106.000.
Keller, Huey T., to Vaughan Furniture Company, Inc. Headboard. 264,280, 5-11-82, Cl. D6-79.000.
Kessler, Bayard F., to Novation, Inc. Acoustic modem. 264,337, 5-11-82, Cl. D14-57.000.
King, Halm C., Jr. Fishing kayak. 264,327, 5-11-82, Cl. D12-302.000.
Klein, Richard S., to Charlton Company, The. Cocktail table or similar article. 264,289, 5-11-82, Cl. D6-175.000.
Knoll International, Inc.: *See—*
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Koehring Company: *See—*
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Kratz, Allen M. Symmetrically interfitting frame. 264,321, 5-11-82, Cl. D11-96.000.
Kudo, Kazue, to Tomy Kogyo Co., Inc. Turtle toy. 264,363, 5-11-82, Cl. D21-157.000.
Kupperman, Dennis: *See—*
Kupperman, Sam; and Kupperman, Dennis, 264,297, Cl. D7-43.000.
Kupperman, Sam; and Kupperman, Dennis, 264,304, Cl. D8-401.000.
Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. Confectionery mold with attached handle. 264,297, 5-11-82, Cl. D7-43.000.
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Litchfield, Leon G.; and Hardy, Terence, 264,293, Cl. D6-191.000.
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Lage, David P.; and Carney, Albert P., to Quick Point, Inc. Picture frame. 264,295, 5-11-82, Cl. D6-245.000.
LeBlanc, James C., to Standard Forge & Axle Company, Inc. Combined armored vehicle and gun turret. 264,322, 5-11-82, Cl. D12-12.000.
Legar, S.A.: *See—*
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Lever Brothers Company: *See—*
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Litchfield, Leon G.; and Hardy, Terence, to L.B. (Plastics) Limited. Drawer runner. 264,292, 5-11-82, Cl. D6-191.000.
Litchfield, Leon G.; and Hardy, Terence, to L.B. (Plastics) Limited. Drawer runner. 264,293, 5-11-82, Cl. D6-191.000.
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Loerop, Ronald W., to Loerop, Inc. Simulative clock. 264,314, 5-11-82, Cl. D10-6.000.
Loiseau, Bernard, to SEB. Steam exhaust valve with timer for pressure cookers. 264,316, 5-11-82, Cl. D10-40.000.
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Mahon, Gordon: *See—*
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Manthei, Robert C. Dinghy. 264,328, 5-11-82, Cl. D12-316.000.
Mariol, James F., to Design Alliance, Inc. Toy train. 264,362, 5-11-82, Cl. D21-129.000.
Martin, Francis R. Combined hockey and golf game board. 264,357, 5-11-82, Cl. D21-15.000.
Masaki, Nobuo; and Nagaoka, Tateki, to Canon Kabushiki Kaisha. Electrophotographic apparatus. 264,345, 5-11-82, Cl. D16-31.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Nishimoto, Teruyuki; Okada, Takao; and Ishise, Kenzo, 264,339, Cl. D14-70.000.
McCarthy, Kevin I. Aquatic aid. 264,370, 5-11-82, Cl. D21-237.000.
McDaniel, John C., to Palmer Company Seattle. Electronic indicator board for gum-dispensing machines. 264,353, 5-11-82, Cl. D20-7.000.
Mead Corporation, The: *See—*
Huliba, David A.; and Robinson, Lonnie P., 264,349, Cl. D18-22.000.
Mefferd, Roy J. Hand tool for loosening or tightening nuts in place of a spanner wrench. 264,299, 5-11-82, Cl. D8-14.000.
Meffert, Uwe. Puzzle toy. 264,361, 5-11-82, Cl. D21-107.000.
Megna, Salvatore J. Hair brush. 264,275, 5-11-82, Cl. D4-35.000.
Meyer, Gene. Candle holder. 264,385, 5-11-82, Cl. D26-9.000.
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Heinrich, Joel S.; and Stewart, R. Bruce, 264,354, Cl. D21-8.000.
Miller, Harry C. Piezoelectrically ignited portable propane gas hand torch. 264,301, 5-11-82, Cl. D8-30.000.
Miller, Paul D.; Thaler, Martin; and Clarke, Martin, to GAF Corporation. Hand held transparency projector. 264,344, 5-11-82, Cl. D16-11.000.

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Nedermann, Bill P. Wall element with a curtain clasp. 264,284, 5-11-82, Cl. D6-135.000.

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Nicholson, William J.; and Farris, Lawrence F., to Plastic Design and Fabrication, Inc. Loud speaker. 264,336, 5-11-82, Cl. D14-34.000.

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Nishimoto, Teruyuki; Okada, Takao; and Ishise, Kenzo, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 264,339, 5-11-82, Cl. D14-70.000.

Nordstrom, Claes. Pallet. 264,323, 5-11-82, Cl. D34-38.000.

Novation, Inc.: *See—*
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Orenstein, Henry. Children's rocker slide. 264,360, 5-11-82, Cl. D21-66.000.

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Pardo, John, to Procter & Gamble Company, The. Bottle. 264,305, 5-11-82, Cl. D9-349.000.

Pardo, John, to Procter & Gamble Company, The. Bottle. 264,306, 5-11-82, Cl. D9-349.000.

Pazurek, William P. Illuminated ball or the like. 264,364, 5-11-82, Cl. D21-204.000.

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Lage, David P.; and Carney, Albert P., 264,295, Cl. D6-245.000.

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Simpson, Danny E.: *See—*
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Stobie, John J.: *See—*
Roskopf, Richard J.; and Stobie, John J., 264,366, Cl. D21-217.000.

Stocker, Hans, to Gardisette International AG. Curtain material. 264,389, 5-11-82, Cl. D92-1.00K.

Strandberg, Kerstin A. H.; and Widlund, Leif U. R., to Molnlycke AB. Menstrual tampon. 264,381, 5-11-82, Cl. D24-59.000.

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Jensen, George B., deceased; and Campion, Stanley F., executor, 264,296, Cl. D7-23.000.

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Yoshiyuki, Hidetoshi, 264,287, Cl. D6-159.000.

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Thaler, Martin: *See—*
Miller, Paul D.; Thaler, Martin; and Clarke, Martin, 264,344, Cl. D16-11.000.

Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Sterilizer unit casing. 264,377, 5-11-82, Cl. D24-9.000.

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Thompson, Donald V. R., to Newburgh Cosmetic Packaging Corp. Combined bottle and cap. 264,310, 5-11-82, Cl. D9-377.000.

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Guscott, John K.; and Thornton, H. Patrick, 264,319, Cl. D10-106.000.

Tomy Kogyo Co., Inc.: *See—*
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Trigere, Pauline. Wearing apparel pocket. 264,265, 5-11-82, Cl. D2-25.000.

Turk, George H.; Short, Ben E.; and Mahon, Gordon, to Electro Mark Corporation. Control panel for a combined cash register and calculator. 264,348, 5-11-82, Cl. D18-12.000.

Ungaro, Nicholas A., to Schweiger Industries, Inc. Table or similar article. 264,290, 5-11-82, Cl. D6-177.000.

V & E Friedland Limited: *See—*
Doggart, John, 264,320, Cl. D10-118.000.

Van Dyke, Eddy G.; and Sheeley, Eugene L., to AMF Incorporated. Golf iron head. 264,368, 5-11-82, Cl. D21-220.000.

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Vaughan Furniture Company, Inc.: *See*—
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Volume Shoe Corporation: *See*—
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Wear-Ever Aluminum, Inc.: *See*—
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Welteroth, Robert C. Playing card holder. 264,358, 5-11-82, Cl. D21-54.000.
White, Dorothy R. Clock. 264,315, 5-11-82, Cl. D10-25.000.
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Williams, David M.: *See*—
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Williams, Robert A.; and Johnson, Marshall B., to Wear-Ever Aluminum, Inc. Base for a vertical rotisserie. 264,341, 5-11-82, Cl. D15-106.000.
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Zabrowsky, Mark W. Combined vanity and storage unit. 264,279, 5-11-82, Cl. D6-29.000.
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Imm, Donald E., 264,300, Cl. D8-28.000.
Zimmerman, Harry. Tire. 264,326, 5-11-82, Cl. D12-136.000.

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Naraghi, Hashem. Almond tree. 4,845, 5-11-82, Cl. 30.000.
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CLASSIFICATION OF PATENTS

ISSUED MAY 11, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 156

60 4,329,190
64 4,329,191
138 4,329,192
162 4,329,193
179 4,329,194
243 4,329,196
583.4 4,329,197
617 SP 4,329,195

CLASS 159

6 R 4,329,198

CLASS 160

183 4,328,853

CLASS 162

19 4,329,199
77 4,329,200
198 4,329,201

CLASS 164

369 4,328,854

CLASS 165

2 4,328,855
8 4,328,856
4,328,857
45 4,328,858
78 4,328,859
81 4,328,860
151 4,328,861
158 4,328,862

CLASS 166

261 4,328,863
274 4,328,864
302 4,328,865
317 4,328,866

CLASS 169

58 4,328,867
62 4,328,868

CLASS 172

311 4,328,869
657 4,328,870

CLASS 173

12 4,328,871
160 4,328,872

CLASS 174

25 C 4,329,536
84 C 4,329,537
119 R 4,329,538
128 S 4,329,539
153 R 4,329,540

CLASS 175

228 4,328,873

CLASS 177

25 4,328,874
165 4,328,875

CLASS 178

3 4,329,541
22.03 4,329,545
69 R 4,329,542

CLASS 179

1 HF 4,329,543
1 VE 4,329,544
81 R 4,329,546
111 E 4,329,547
185 4,329,548

CLASS 180

6.44 4,328,876
70 R 4,328,877
182 4,328,878
219 4,328,879

CLASS 182

93 4,328,880

CLASS 192

58 B 4,328,881
64 4,328,882
85 CA 4,328,883
105 CF 4,328,884
142 R 4,328,885

CLASS 198

347 4,328,886
367 4,328,889
396 4,328,887
499 4,328,888

CLASS 200

61.45 M 4,329,549
84 C 4,329,550
147 R 4,329,551
4,329,552
148 A 4,329,553
151 4,329,554

157 4,329,555

CLASS 201

27 4,329,202

CLASS 202

135 4,329,203
174 4,329,204
4,329,205
177 4,329,206

CLASS 204

54 L 4,329,207
59 R 4,329,208
98 4,329,209
107 4,329,210
149 4,329,211
157.1 R 4,329,212
180 G 4,329,213
195 R 4,329,214
229 4,329,215
252 4,329,216
4,329,217
283 4,329,218
290 F 4,329,219

CLASS 206

5.1 4,328,890
158 4,328,891
229 4,328,892
435 4,328,893
461 4,328,894
496 4,328,895
497 4,328,896

CLASS 208

89 4,329,220
214 4,329,221
254 R 4,329,222

CLASS 209

167 4,329,223

CLASS 210

96.1 4,329,225
180 4,329,226
220 4,329,227
230 4,329,228
321.2 4,329,229
413 4,329,230
416.4 4,329,231
614 4,329,232
673 4,329,233
709 4,329,224
752 4,329,234
777 4,329,235

CLASS 211

41 4,328,897
4,328,898
4,328,899

CLASS 213

62 A 4,328,900

CLASS 219

10.55 F 4,329,557
69 W 4,329,558
89 4,329,559
100 4,329,560
110 4,329,561
121 LJ 4,329,562
4,329,564
121 P 4,329,563
216 4,329,565
4,329,566
222 4,329,567
497 4,329,568
535 4,329,569

CLASS 220

3.7 4,328,903
23.4 4,328,902
88 A 4,328,901
256 4,328,904
258 4,328,905
260 4,328,906

CLASS 221

63 4,328,907
213 4,328,908

CLASS 222

54 4,328,909
81 4,328,910
182 4,328,911
212 4,328,912
413 4,328,913

CLASS 224

31 4,328,914
32 R 4,328,915
103 4,328,916
254 4,328,917

CLASS 227

83 4,328,918
155 4,328,919

CLASS 228

20 4,328,920
222 4,328,921

CLASS 229

27 4,328,922
33 4,328,923
43 4,328,924

CLASS 233

7 4,328,925

CLASS 235

78 R 4,329,570
92 EC 4,329,572
92 PK 4,329,571
454 4,329,573
463 4,329,574
487 4,329,575
489 4,329,576

CLASS 236

13 4,328,926
49 4,328,927

CLASS 242

18 DD 4,328,928
47.01 4,328,929
55 4,328,930
67.5 4,328,931
71.8 4,328,932
107.2 4,328,933
107.4 A 4,328,934
192 4,328,935
199 4,328,936
218 4,328,937

CLASS 244

3.1 4,328,938
102 R 4,328,939
136 4,328,940

CLASS 248

550 4,328,941
558 4,328,942
578 4,328,943
593 4,328,944

CLASS 249

67 4,328,945

CLASS 250

201 4,329,577
4,329,578
203 R 4,329,579
215 4,329,580
221 4,329,581
292 4,329,582
330 4,329,583
358 R 4,329,584
403 4,329,585
426 4,329,586
439 P 4,329,587
445 T 4,329,588
468 4,329,589
511 4,329,590
548 4,329,591

CLASS 251

9 4,328,946
80 4,328,947
149.6 4,328,948
165 4,328,949
297 4,328,950

CLASS 252

8.55 D 4,329,236
8.75 4,329,237
12 4,329,238
34.7 4,329,249
51.5 A 4,329,239
4,329,240
62.52 4,329,241
70 4,329,242
75 4,329,243
99 4,329,244
102 4,329,245
103 4,329,246
104 4,329,247
389 R 4,329,250
429 B 4,329,251
4,329,252
4,329,253
4,329,255
4,329,256
430 4,329,254
435 4,329,257
441 4,329,258
4,329,259
446 4,329,260
582 4,329,261
628 4,329,248

CLASS 254

89 H 4,328,951
134.3 R 4,328,952
4,328,953
344 4,328,954

CLASS 256

8 4,328,955

CLASS 260

97.6 4,329,280
112 B 4,329,281
153 4,329,282
156 4,329,283
239 R 4,329,284
239.1 4,329,285
397.2 4,329,295
397.4 4,329,294
4,329,296
404 4,329,297
405.6 4,329,298
429 R 4,329,299
440 4,329,300
665 R 4,329,301
925 4,329,302
986 4,329,303

CLASS 264

8 4,329,304
4,329,305
137 4,329,306
160 4,329,307
162 4,329,308
167 4,329,309
211 4,329,310
285 4,329,311
306 4,329,312
349 4,329,313
519 4,329,314
555 4,329,315

CLASS 266

196 4,328,957
233 4,328,958
275 4,328,956
281 4,328,959

CLASS 267

8 R 4,328,960

CLASS 271

12 4,328,962
236 4,328,961
293 4,328,963

CLASS 272

136 4,328,964
137 4,328,965

CLASS 273

1 F 4,328,966
63 B 4,328,968
63 G 4,328,967
203 4,328,969
239 4,328,970
408 4,328,971

CLASS 277

1 4,328,972
3 4,328,973
122 4,328,974

CLASS 279

91 4,328,975

CLASS 280

806 4,328,976

CLASS 282

27.5 4,328,977

CLASS 283

7 4,328,978

CLASS 285

174 4,328,979
286 4,328,981
341 4,328,980
351 4,328,982
382 4,328,983

CLASS 289

1.2 4,328,984

CLASS 290

40 R 4,329,592
44 4,329,593

CLASS 292

201 4,328,985

CLASS 293

120 4,328,986

CLASS 294

111 4,328,987

CLASS 296

10 4,328,988
27 4,328,989
222 4,328,990

CLASS 297

271 4,328,991
439 4,328,992
453 4,328,993

CLASS 299

11 4,328,994
17 4,328,995
43 4,328,996

CLASS 301

37 P 4,328,997

CLASS 307

10 R 4,329,594
107 4,329,595
141.8 4,329,596
296 R 4,329,598
455 4,329,597
520 4,329,599
540 4,329,600

CLASS 308

3.8 4,328,998
6 C 4,328,999
187 4,329,000

CLASS 310

49 R 4,329,601
52 4,329,602
61 4,329,603
68 R 4,329,604
4,329,605
71 4,329,606
82 4,329,607
91 4,329,608
183 4,329,609
220 4,329,610
227 4,329,611
247 4,329,612
344 4,329,613

CLASS 312

71 4,329,001
196 4,329,002
245 4,329,003

CLASS 313

115 4,329,614
141 4,329,615
198 4,329,616
268 4,329,617
431 4,329,618
470 4,329,619
478 4,329,620

CLASS 315

47 4,329,621
49 4,329,622
151 4,329,623
4,329,624
158 4,329,625
169.4 4,329,626
209 R 4,329,627
209 SC 4,329,628
323 4,329,629

CLASS 318

258 4,329,630
466 4,329,631
587 4,329,632
612 4,329,633
685 4,329,634
696 4,329,635
721 4,329,636

CLASS 322

20 4,329,637

CLASS 323

233 4,329,638
315 4,329,639

CLASS 324

73 R 4,329,640
115 4,329,641
158 F 4,329,642
4,329,643
160 4,329,644
166 4,329,645
307 4,329,646
323 4,329,647
404 4,329,648
438 4,329,649
450 4,329,650

CLASS 328

14 4,329,651
72 4,329,652
155 4,329,653
233 4,329,654

CLASS 330

149 4,329,655
257 4,329,656
297 4,329,657

CLASS 331

94.55 4,329,659
96 4,329,663

CLASS 332

7.51 4,329,664

CLASS 333

182 4,329,665
191 4,329,666
206 4,329,667

CLASS 335

18 4,329,668
20 4,329,669
56 4,329,670
213 4,329,671
229 4,329,672
288 4,329,673

CLASS 336

92 4,329,674

CLASS 338

198 4,329,676

CLASS 339

5 M 4,329,004
18 B 4,329,005
126 R 4,329,006
188 R 4,329,007
217 S 4,329,008
223 R 4,329,009
265 R 4,329,010

CLASS 340

84 4,329,677
310 A 4,329,678
347 AD 4,329,679
396 4,329,680
568 4,329,681
581 4,329,682
679 4,329,683
707 4,329,684
825.84 4,329,685

CLASS 343

6 R 4,329,686
13 R 4,329,687
17.7 4,329,688
700 MS 4,329,689
709 4,329,690
713 4,329,691
780 4,329,692

CLASS 346

33 TP 4,329,693
74.3 4,329,694
75 4,329,695
4,329,696
135.1 4,329,697
140 R 4,329,698

CLASS 350

6.6 4,329,011
6.8 4,329,012
36 4,329,013
89 4,329,014
91 4,329,015
96.12 4,329,016
96.15 4,329,017
96.23 4,329,018
129 4,329,019
162 SF 4,329,020
259 4,329,021
426 4,329,022
431 4,329,023
465 4,329,024

CLASS 351

7 4,329,025

CLASS 354

5 4,329,026
4,329,027
23 D 4,329,028
4,329,029
4,329,030
4,329,031
25 4,329,032
4,329,033
37 4,329,034
4,329,035
60 A 4,329,036
187 4,329,037
195 4,329,038
266 4,329,039
286 4,329,040
293 4,329,041
324 4,329,042

CLASS 355

14 R 4,329,043
15 4,329,044
67 4,329,045
77 4,329,046

CLASS 356

28 4,329,047
73 4,329,048
124 4,329,049
305 4,329,050
320 4,329,051
335 4,329,052
336 4,329,053
4,329,054
346 4,329,055
350 4,329,056
4,329,057
352 4,329,058
353 4,329,059
375 4,329,060
414 4,329,061
4,329,062

CLASS 357

2 4,329,699
22 4,329,700
28 4,329,701
31 4,329,702
35 4,329,703
41 4,329,704
43 4,329,705
71 4,329,706
73 4,329,707

CLASS 358

36 4,329,708
44 4,329,709
81 4,329,710
86 4,329,675
114 4,329,711
128.5 4,329,712
174 4,329,713
198 4,329,714
214 4,329,715
231 4,329,716
282 4,329,717

CLASS 360

9 4,329,718
14 4,329,719
74.3 4,329,720
78 4,329,721
98 4,329,722
109 4,329,723
4,329,724

CLASS 361

18 4,329,725
58 4,329,726
80 4,329,727
91 4,329,728
4,329,729
100 4,329,730
218 4,329,731
283 4,329,732
302 4,329,733

CLASS 362

13 4,329,734
18 4,329,735
23 4,329,736
32 4,329,737
61 4,329,738
153 4,329,739
184 4,329,740

CLASS 366

34 4,329,063
61 4,329,064
97 4,329,065
150 4,329,066
182 4,329,067
214 4,329,068
270 4,329,069

CLASS 372

38 4,329,662
45 4,329,658
46 4,329,660
4,329,661

CLASS 400

118 4,329,070
120 4,329,071
208 4,329,072
4,329,073
216.5 4,329,074
229 4,329,075

CLASS 403

109 4,329,076
287 4,329,077
316 4,329,078
319 4,329,079

CLASS 404

74 4,329,080
110 4,329,081

CLASS 405

3 4,329,082
150 Re.30,929
154 4,329,083
157 4,329,084
169 4,329,085
171 4,329,086
179 4,329,087

CLASSIFICATION OF PATENTS

196 4,329,088
262 4,329,089
263 4,329,090

CLASS 407

41 4,329,091

CLASS 408

11 4,329,092
15 4,329,093
77 4,329,094
112 4,329,095

CLASS 409

15 4,329,096

CLASS 411

88 4,329,097
412 4,329,099

CLASS 414

21 4,329,100
24.5 4,329,101
4,329,102
4,329,103
139 4,329,104
316 4,329,105
388 4,329,106
463 4,329,107
534 4,329,108
685 4,329,109
730 4,329,110
733 4,329,111
751 4,329,112

CLASS 415

116 4,329,113
145 4,329,114

CLASS 416

11 4,329,115
19 4,329,116
170 R 4,329,117
178 4,329,118
226 4,329,119

CLASS 417

12 4,329,120
270 4,329,121
365 4,329,122
393 4,329,123
545 4,329,124
569 4,329,125

CLASS 418

1 4,329,126
48 4,329,127
83 4,329,128
138 4,329,129
150 4,329,130

CLASS 420

433 4,329,174

CLASS 422

52 4,329,316
58 4,329,317
59 4,329,318
224 4,329,319

CLASS 423

1 4,329,320
22 4,329,321
74 4,329,322
240 4,329,323
244 4,329,324
267 4,329,325
308 4,329,326
314 4,329,327
333 4,329,328
461 4,329,329
473 4,329,330

CLASS 424

8 4,329,331
9 4,329,332
19 4,329,333
70 4,329,334
4,329,335
4,329,336
105 4,329,337
180 4,329,338
4,329,339
232 4,329,340
244 4,329,341
245 4,329,342
248.54 4,329,343
250 4,329,344
251 4,329,345
4,329,346
4,329,347
4,329,348
256 4,329,349
258 4,329,350
263 4,329,351
267 4,329,352
4,329,353
270 4,329,354
272 4,329,355
274 4,329,356
275 4,329,357
309 4,329,358
312 4,329,359
314 4,329,360
317 4,329,361
320 4,329,362
4,329,363
324 4,329,364
4,329,365
4,329,366
330 4,329,367
334 4,329,368

CLASS 425

6 4,329,131
13 4,329,132
114 4,329,133
157 4,329,134
174 4,329,135
174.8 R 4,329,136

CLASS 426

3 4,329,369
46 4,329,370
461 4,329,371
535 4,329,372
538 4,329,373
582 4,329,374
632 4,329,375

CLASS 427

4 4,329,376
9 4,329,377
157 4,329,378
166 4,329,379
236 4,329,380
386 4,329,381

CLASS 428

4 4,329,382
36 4,329,383
40 4,329,384
141 4,329,385
196 4,329,386
4,329,387
216 4,329,388
263 4,329,389
264 4,329,390
265 4,329,391
296 4,329,392
325 4,329,393
342 4,329,394
344 4,329,395
354 4,329,396
379 4,329,397
413 4,329,398
422 4,329,399
426 4,329,400
462 4,329,401
621 4,329,402

CLASS 429

35 4,329,403
50 4,329,404
56 4,329,405
92 4,329,406
101 4,329,407
228 4,329,408

CLASS 430

1 4,329,409
5 4,329,410
30 4,329,411
42 4,329,412
54 4,329,413
103 4,329,414
109 4,329,415
133 4,329,416
264 4,329,417
270 4,329,418
283 4,329,419
293 4,329,420
322 4,329,421
331 4,329,422
534 4,329,423

CLASS 431

75 4,329,137
90 4,329,138
350 4,329,139
359 4,329,140

CLASS 432

17 4,329,141
19 4,329,142

CLASS 435

5 4,329,424
16 4,329,425
80 4,329,426
116 4,329,427
167 4,329,428
207 4,329,429
219 4,329,430
253 4,329,431
4,329,432
255 4,329,433

CLASS 521

27 4,329,434
38 4,329,435
99 4,329,436
100 4,329,437

CLASS 523

122 4,329,277
161 4,329,262
162 4,329,264
323 4,329,267

CLASS 524

166 4,329,268
180 4,329,279
288 4,329,272
376 4,329,266
386 4,329,271
496 4,329,265
502 4,329,276
518 4,329,270
523 4,329,278
862 4,329,273
4,329,274
4,329,275

CLASS 525

17 4,329,263
64 4,329,438
180 4,329,439
366 4,329,269

CLASS 526

142 4,329,440
193 4,329,441

CLASS 528

49 4,329,442
180 4,329,443
272 4,329,444
416 4,329,445

CLASS 536

6.4 4,329,450
18.6 4,329,449
69 4,329,446
4,329,447
77 4,329,451
119 4,329,452
123 4,329,448

CLASS 544

25 4,329,453
89 4,329,455
026 4,329,454
113 4,329,456
114 4,329,457
217 4,329,458
264 4,329,459
301 4,329,460
375 4,329,461
387 4,329,462
405 4,329,463

CLASS 546

17 4,329,464
072 4,329,465
125 4,329,466
138 4,329,467
158 4,329,468
203 4,329,469
210 4,329,470
4,329,471
270 4,329,472
281 4,329,473
345 4,329,474

CLASS 548

141 4,329,475
153 4,329,476
305 4,329,477
519 4,329,286
549 4,329,556

CLASS 549

11 4,329,478
39 4,329,479
78 4,329,480
241 4,329,287
4,329,291
4,329,292
316 4,329,290
363 4,329,288
449 4,329,289
470 4,329,293

CLASS 556

410 4,329,481
436 4,329,482
4,329,483
442 4,329,484
458 4,329,485
4,329,486

CLASS 560

60 4,329,487
62 4,329,488
79 4,329,489
90 4,329,490
174 4,329,491
205 4,329,492

CLASS 562

414 4,329,493
425 4,329,494
426 4,329,495
468 4,329,496
478 4,329,497
553 4,329,498

CLASS 564

81 4,329,499
128 4,329,500
305 4,329,501
349 4,329,502
418 4,329,503
443 4,329,504
476 4,329,505

CLASS 568

310 4,329,506
332 4,329,507
361 4,329,508
385 4,329,509
411 4,329,510
454 4,329,511
484 4,329,512
492 4,329,513
577 4,329,514
621 4,329,515
697 4,329,516
804 4,329,517
807 4,329,518
854 4,329,519
896 4,329,520
909 4,329,521
941 4,329,522
948 4,329,523

CLASS 570

190 4,329,524
191 4,329,525
203 4,329,526
245 4,329,527

CLASS 585

3 4,329,528
20 4,329,529
259 4,329,530
268 4,329,531
407 4,329,532
466 4,329,533

CLASSIFICATION OF DESIGNS

D2— 25 264,265
310 264,268
313 264,269
415 264,270
264,271
264,272
264,273
D3— 39 264,274
71 264,266
264,267
D4— 35 264,275
D6— 4 264,276
20 264,277
28 264,278
29 264,279
79 264,280
105 264,281
264,282
130 264,283
135 264,284
143 264,285
153 264,286
159 264,287
168 264,288
175 264,289
177 264,290
264,291
191 264,292
264,293
264,294
245 264,295
D7— 23 264,296
43 264,297
103 264,298
D8— 14 264,299
28 264,300
30 264,301
367 264,302
264,303
401 264,304
D9— 349 264,305
264,306
352 264,307
376 264,308
264,309
377 264,310
410 264,311
412 264,312
416 264,313
D10— 6 264,314
25 264,315
40 264,316
47 264,317
106 264,318
264,319
118 264,320
D11— 96 264,321
D12— 12 264,322
99 264,324
115 264,325
136 264,326
302 264,327
316 264,328
327 264,329
D13— 28 264,330
32 264,331
D14— 7 264,333
264,334
06 264,332
12 264,335
34 264,336
57 264,337
58 264,338
70 264,339
109 264,340
D15— 106 264,341
149 264,342
D16— 7 264,343
11 264,344
31 264,345
38 264,346
D18— 11 264,347
12 264,348
22 264,349
D19— 35 264,350
62 264,351
92 264,352
D20— 7 264,353
D21— 8 264,354
13 264,355
264,356
15 264,357
54 264,358
65 264,359
66 264,360
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